EXHIBIT A

WEST POINT CITY CORPORATION

STORM DRAIN CAPITAL FACILITIES AND IMPACT FEE FACILITIES PLAN

MAYOR
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SIGNATURE DATE

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AUGUST 10, 2021

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TABLE OF CONTENTS

INDEX TO TABLES

INDEX TO FIGURES

APPENDICES

A. PROJECTS
B. STORM DRAIN AND LAND DRAIN MAPPING SYSTEM
C. AUTODESK STORM AND SANITARY SOFTWARE

I. Executive Summary

This Storm Drain Capital Facilities Plan (CFP) is an update of the Storm Drain Master Plan, dated 2009.

This CFP will lay out the anticipated projects to be undertaken by the City through buildout. Projects include the construction, purchase or replacement of the City's storm drain needed storm drain facilities.

It is intended that this CFP will be used as a guide to assist the City in determining the location and size of system improvements through buildout[1]. It is recognized that not all lands will be developed as densely as allowed by zoning, and some zoning may be changed to allow higher densities. The variability of development density and location is accounted for by a regular review and update of the City's CFP.

Facilities recommended in this study have been sized to accommodate flows at buildout[1] conditions. Population Data and estimated growth rates have been used to estimate the buildout population and year. The estimated buildout population is 39,314. Using estimated growth rates, the estimated the buildout year is approximately 2082.

The current storm drain facilities consist of storm drain pipes and drainage/irrigation ditches conveying runoff throughout the City. The ditches used to convey storm water are often under sized and therefore concerns of flooding increase with development. The drainage ditches typically replaced with piping to allow for needed roadway capacity improvements. Projects identified in this study include installing storm drain pipe to replace these open ditches. This storm water form the City eventually reaches county drains or sloughs that flow into the Great Salt Lake.

With the assistance of West Point City Staff, the City was delineated into drainage basins based on the current and proposed future outfalls. These outfalls enter into the following drainages: 200 South Drain (A), 700 South Drain (B), Great Salt Lake (C), Howard Slough (D), South Arm of the Howard Slough (E) and the Clinton Drain (F). Each basin was further delineated into subbasins based on existing storm drain pipes and contour data. Autodesk Storm and Sanitary software was used to model the drainage basins to generate peak flows from each subbasin. The peak flows were used to size future storm drain pipes.

West Point City consists of both developed and undeveloped areas. The western portion of the City is largely undeveloped while the east is more heavily developed. The City's General Plan was used to determine land use densities for use in the model on areas with partial development or future development. It is assumed that undeveloped areas will be completed with onsite detention. These areas were modeled with 0.2 cubic feet per second release rates.

Some of the projects identified in this Plan will be necessitated by new development. The growth-related projects should appropriately be paid for by the new development that necessitate the project. Utah Code provides a mechanism for the City to collect from new development their proportionate share of the costs related to providing the capital facilities needed within the City. The mechanism is collection of an impact fee. The amount of the impact fee is established through creation of an Impact Fee Facilities Plan (IFFP), which is a subset of this CFP that identifies the capital projects necessitated by new development.

[1] Buildout is the point at which no additional growth is theoretically possible, given zoning restraints.

The resulting IFFP will then be analyzed by others to establish an appropriate impact fee in a separate document called an Impact Fee Analysis (IFA).

The preliminary estimate of probable cost of all of the impact fee eligible improvements projected for buildout is $4,280,160[1]. These improvements will take place over the course of time it takes for the projected buildout growth to occur.

Pipe locations and sizes in this study are based on delineated basins and subbasins. Any change from the estimated drainage areas may require pipe sizes and locations to be reevaluated. It is recommended that this plan be reevaluated and modified within six years or as growth within the City dictates.

A. CERTIFICATION of Compliance with Utah State Code (11-36a-306(1)):

To the extent the following items are addressed in the IFFP, Gardner Engineering certifies that the following impact fee facilities plan:

1. Includes only costs of public facilities that are:

a. allowed under the Impact Fees Act; and

b. actually incurred; or

c. projected to be incurred or encumbered within six years after the day on which each impact fee is paid;

2. Does not include:

a. costs of operation and maintenance of public facilities;

b. cost for qualifying public facilities that will raise the level of service for the facilities, through impact fees, above the level of service that is supported by the existing resident's;

c. an expense for overhead, unless the expense is calculated pursuant to a methodology that is consistent with generally accepted cost accounting practices and the methodological standards set forth by the federal Office of Management and Budget for federal reimbursement; and

3. Complies in each and every relevant respect with the Impact Fee Act.

____

Ryan Christensen, P.E.

[1] Refer to Total Cost of Impact Fee Eligible Projects Needed At Buildout. Dollar amount is shown in current value.

II. Introduction

West Point City has retained Gardner Engineering to update their Storm Drain Capital Facilities Plan (CFP) from the 2009 Storm Drain Master Plan.

The CFP is being updated using the City's current General Plan to estimated density future development.

The steps shown below have been followed in preparing this *West Point City Storm Drain Capital Facilities Plan.*

- Complete existing storm drain system inventory – manhole and catch basin data gathered by City staff and surveyed by Gardner Engineering;
- Identify existing and future storm drain outfalls then delineate drainage basins;
- Create storm drain model for build out conditions and calculate peak flows in each sub basin;
- Based on the peak flows – size future storm drain pipes along existing and future roads or as directed by City staff;
- Identify Capital Facilities Plan projects to be reviewed with City Staff;
- Prepare cost estimates for future projects and identify impact fee eligible projects.

The objectives of the CFP update are to estimate future storm water runoff in order to size future storm drain pipes, and prepare costs estimates for proposed projects to be used for impact fee analysis. The Impact Fee Act requires that an impact fee be imposed only when based on and Impact Fee Facilities Plan (IFFP). An IFFP must document the following:

A. Identify the existing level of service (LOS).

B. Establish a proposed level of service (LOS.

C. Identify any excess capacity to accommodate future growth at the proposed level of service

D. Identify demands placed upon existing public facilities by new development activity at the proposed level of service.

E. Identify the means by which the political subdivision or private entity will meet those growth demands identified in D, above, through "Selling" the excess capacity in C, or The acquisition of new capacity, which acquisition would be financed through grants, bonds, interfund loans, impact fees and anticipated or accepted dedication of system improvements.

III. Demographics

Current and buildout population estimates have been prepared to assist in the evaluation of current and future infrastructure. In order to prioritize Capital Facilities Plan projects, it is necessary to estimate buildout population and project the buildout year. Population data and estimated growth rates were used to determine buildout population and year. This data is presented below.

A. Projected Population at Buildout

The West Point City General Plan (*Figure 1*) was used to estimate buildout population. See *Table 1 – Projected Total Population By Land Use At Buildout*.

The number of acres and the densities of each land use zone, taking into account a percentage of land for roadways and other public and undevelopable lands, were averaged and summarized as shown in the following table[1]:

TABLE 1 - PROJECTED TOTAL POPULATION BY LAND USE AT BUILDOUT

Average Land Use Density	Total Acres	Units/ Acre	Units at Buildout	Population at Buildout	Undeveloped acres
R-1 Zoning (12,000 ft^2 Lots)	1602.95	2.2	3,526	12,343	1072.8
R-2 Zoning (10,000 ft^2 Lots)	957.07	2.7	2,584	9,044	671.7
R-3 Zoning (9,000 ft^2 Lots)	797.15	3.6	2,870	10,044	78.4
R-4 Zoning	122.94	8	984	3,442	78.7
R-5 (Residential 20 Units Per Acre)	5.44	20	109	381	0.0
A-40 (Agricultural 1 Unit Per 1 Acre)	169.88	0.2	34	119	168.7
N-C Zoning (Neighborhood Commercial)	35.39	2.5	88	310	14.6
C-C Zoning (Community Commercial)	210.62	2.5	527	1,843	134.2
R-C Zoning (Regional Commercial)	49.16	5	246	860	49.2
P-O Zoning (Professional Office)	24.42	5	122	427	0.0
R/I-P Zoning (Research/Industrial Park)	28.61	5	143	501	28.6
Parks and Public	493.24	-	-	-	237.2
Total (used for planning infrastructure)	4496.87		11,233	39,314	2,534

[1] Units-per acre density multipliers were provided by the City.

*R-1 includes additional area outside of existing city boundary

West Point City

General Plan Map

Adopted November 19, 2019

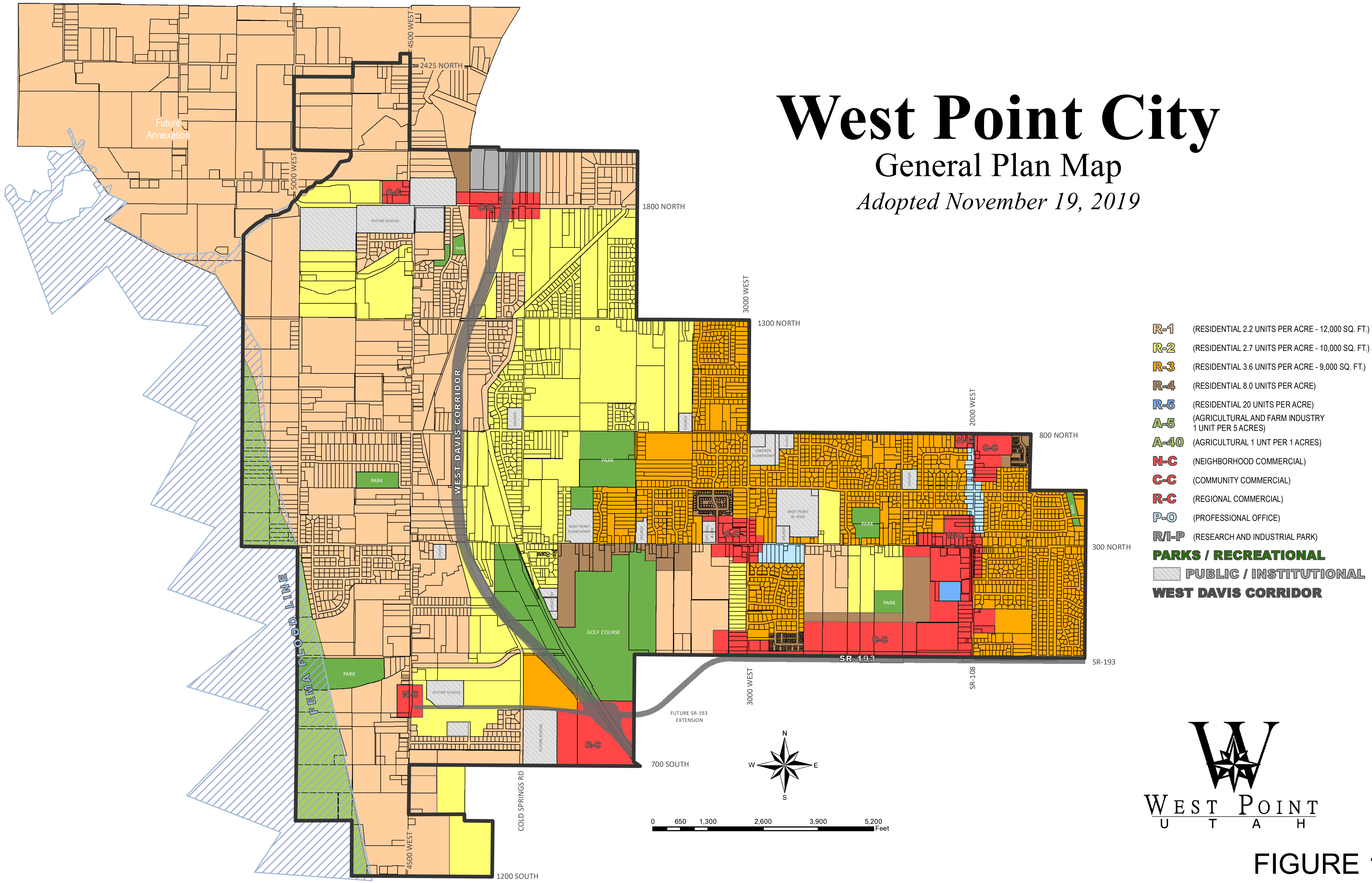


FIGURE 1

B. Current Population

Miscellaneous data are shown in *Table 2 – Growth Projections*. The data summarizes growth projections within the City's boundary. The Utah Governor's Office of Planning and Budget has estimated average annual rate of growth in the City at 3.0% between the years 2000-2060. Using United States Census population for 2019 and a 2% growth rate Table 2 was populated. It is estimated that the year of buildout will occur around the year 2082.

TABLE 2 - GROWTH PROJECTIONS, CURRENT SERVICE AREA 2019-2083[1]

Year	% Increase, Population	Pop. / Conn.	Pop.
2019		3.50	10,957
2020	3.0%	3.50	11,286
2021	3.0%	3.50	11,624
2022	2.0%	3.50	11,857
2023	2.0%	3.50	12,094
2024	2.0%	3.50	12,336
2025	2.0%	3.50	12,582
2030	2.0%	3.50	13,892
2040	2.0%	3.50	16,934
2050	2.0%	3.50	20,643
2060	2.0%	3.50	25,164
2065	2.0%	3.50	27,783
2070	2.0%	3.50	30,674
2075	2.0%	3.50	33,867
2080	2.0%	3.50	37,392
2081	2.0%	3.50	38,140
2082	2.0%	3.50	38,902
2083	2.0%	3.50	39,680

C. Service Area and Projected Land Use

The service area boundary used in development of this Capital Facilities Plan includes the entire city of West Point, as it currently exists. The acreages and density factors of service areas were compiled from the General Plan Land Use Map. There are a few areas outside of the City that flow into West Point. These areas are also addressed in this study. Future Annexation areas should be addressed separately as necessary.

[1] U.S. Census Bureau, Population Estimates Program (PEP) July 1, 2019 West Point, Utah

IV. Capital Facilities Plan / Impact Fee Facility Plan

A. Design Standards for Planning

Autodesk® Storm and Sanitary Analysis*, is modeling package used for analyzing and designing storm drain systems. The West Point storm drain system is comprised of major and minor systems.* The minor system consists of the components including curbs, gutters, ditches, inlets, pipes, open channels, etc. The minor system is normally designed to carry runoff from the 10-year storm event. The major system provides overland relief for stormwater flows exceeding the capacity of the minor system. This usually happens during more infrequent storm events such as the 50 and 100-year storms. The major storm drainage system consists of a combination of storm drain pipes and channelizing surface flows, including the streets and frontages within the right of way. The roadways in newly developed areas should be constructed lower than the adjacent lots, which allow roadways to convey the runoff exceeding the capacity of the minor system. This CFP analyzes the minor storm drainage system designed to handle the 10-year storm event. Applying the 100-year storm event to the major storm drainage system is a more complex issue and is not addressed in this CFP. Detailed topography citywide would be necessary to model the flow patterns of a 100-year storm event. It is recommended that the City require that the major storm system in new development be designed to meet the design criteria of the 100-year storm event. The following design criteria are used in this study:

Pipe – Size: New storm drain pipes shall be a minimum of 15" as required by West Point City. The maximum pipe size is restricted due to the water table level. It is recommended that the maximum pipe size be 42" based on necessary cover. Certain areas may allow for larger pipe or require smaller maximum diameter depending on the actual water table elevation.

Pipe – Slope: Pipes slopes that were used in the model were taken from the data gathered as part of the field survey. Future pipes were sized using an estimated 0.50% slope.

Flow Calculations: The Manning's Equation was used for flow calculations to analyze pipe capacity. For future concrete pipe flow calculations, a Manning's Coefficient (n) of 0.013 was used.

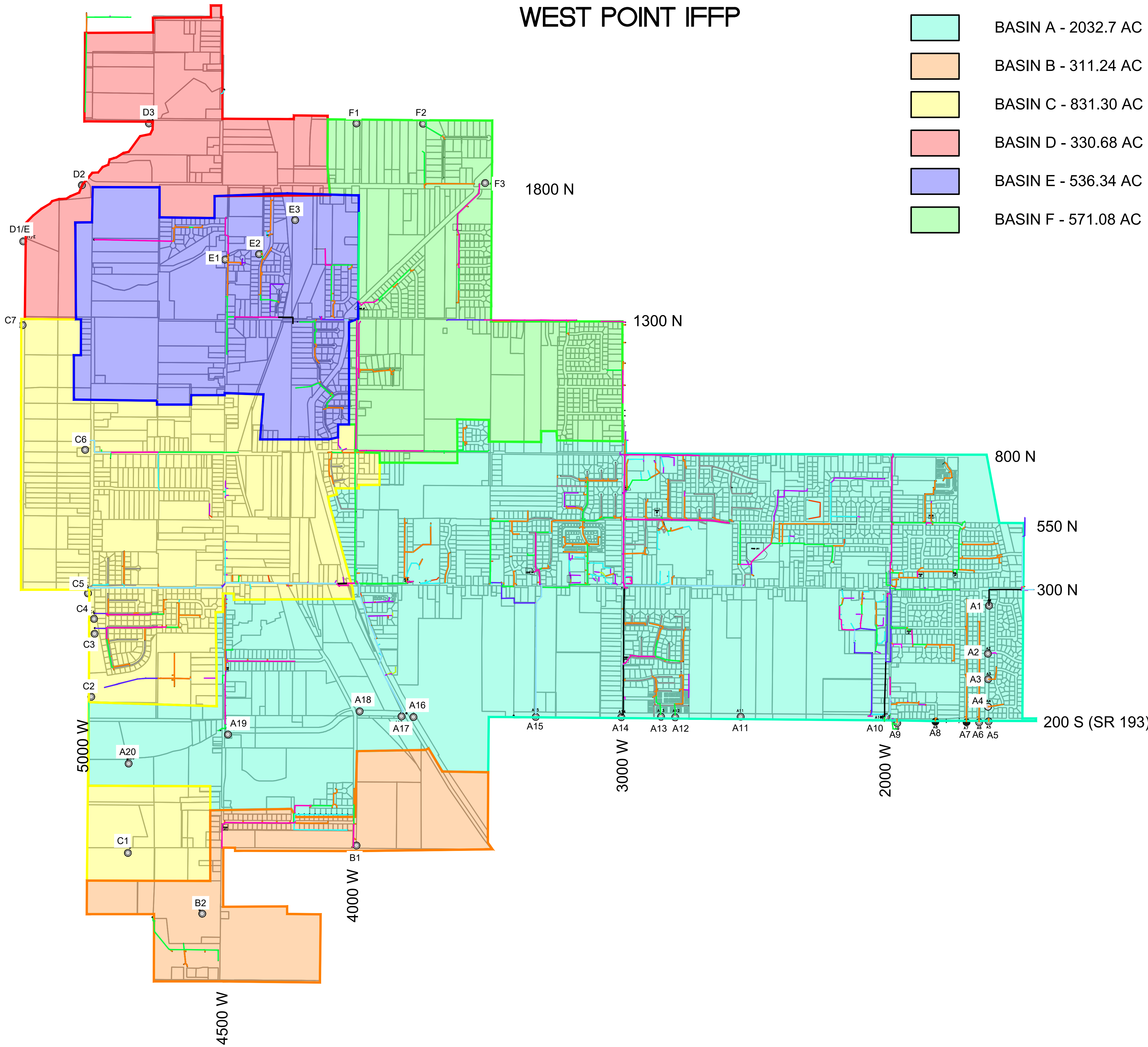
B. Storm Drainage Computer Model

The modeling software used to develop the storm drainage model was Autodesk® Storm and Sanitary Analysis. The methodology and process behind the storm drainage model for West Point City is included in *Appendix C*.

C. Inventory of Existing System

Inventory of the existing storm drain system was completed by both City and Gardner Engineering staff. The City staff gathered data on the existing storm drain pipes, inlets and manholes. Storm drain facilities were mapped by hand and data was gathered including pipe size, inlet / manhole size, and invert depths. Gardner Engineering surveyed the location of each manhole and inlet. Those points were overlaid on a map of West Point and City staff drafted in all objects and attached data indentifying each structure.

OVERALL BASIN MAP
WEST POINT IFFP



- BASIN A - 2032.7 AC
- BASIN B - 311.24 AC
- BASIN C - 831.30 AC
- BASIN D - 330.68 AC
- BASIN E - 536.34 AC
- BASIN F - 571.08 AC

BASIN OUTLET	PEAK DISCHARGE cfs
A1	2.24
A2	7.32
A3	3.12
A4	2.12
A5	1.09
A6	3.81
A7	4.77
A8	1.01
A9	0.94
A10	32.56
A11	40.61
A12	2.09
A13	2.21
A14	30.53
A15	20.58
A16	25.34
A17	10.69
A18	14.56
A19	8
A20	12.06
	225.654
B1	21.93
B2	33.72
	55.65
C1	21.11
C2	12.76
C3	15.3
C4	12.84
C5	40.27
C6	31.74
C7	8.18
	142.2
D1	58.09
D2	30.6
D3	23.57
	112.26
E1	43.71
E2	14.26
E3	21.36
	79.33
F1	83.39
F2	17.13
F3	16.73
	117.25

FIGURE 2

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Scale: Custom
Designed: KAN
Drafted: KAN
Checked: RC

Revisions

Date	Description

OVERALL BASIN MAP
WEST POINT IFFP
PROJECT ADDRESS
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The existing detention ponds were modeled using AutoCAD grading objects based on the ponds footprint, side slopes, and depth to determine capacity. Pond outlet control was determined and a storage versus discharge relationship was created to be used in the model.

The completed inventory of the storm drain system was used to delineate basins and to prepare the storm drain model. Due to the amount of information gathered, a copy this inventory is not included in this study. Both the City and the Engineer have a copy of all inventory data including maps and data sheets. Components of the existing system have been drafted and are included on the Storm Drain System sheets 1-17. These sheets are located in *Appendix B - Storm Drain System* of this report. The Storm Drain System sheets include maps of the existing facilities, proposed projects, and basin flows.

D. Method of Financing Assets

Existing facilities have been financed through general taxes, monthly storm drain utility fees, and impact fees.

E. Level of Service Summary

The level of service for the West Point Storm Drain system is summarized below. The proposed level of service is the same as the existing level of service. There is not a minimum State standard for storm drain. The level of service is established to provide infrastructure needed to protect residents and property from flooding. Standards are set to find a balance between cost, feasibility, and acceptable water levels throughout the city during a storm event. The table below includes the existing and proposed level of service standards.

Level of Service

Description	Standard
Allowable Runoff	Development within the City is required to detain storm water with a release rate of 0.2 CFS / AC. This release rate is intended to maintain predevelopment runoff rates
Detention	Volume required to hold the 100 – year design storm with at least 1 ft of freeboard. Release rate per Allowable Runoff.
Storm Drain Conveyance	Pipes shall be designed to carry the minor 10-year storm. The major 100-year storm is planned to be conveyed in detention ponds, pipes, and within road right of ways. Minimum pipe size is 15” RCP with adequate slope to carry necessary flows.

F. Excess Capacity

In order to estimate the remaining excess capacity and the appropriate buy-in valuation, storm drain pipes that were funded by the City with potential excess capacity were identified. The method used to determine excess capacity is based on the existing linear feet (LF) of collection improvements compared to the linear feet of excess capacity within the system. This is then weighted based on the relative value of each pipe category according to diameter (e.g. larger diameter pipes are more expensive and thus are weighted more when determine proportionate excess capacity). Based on this analysis, there is a total of 420,323 weighted LF of pipe, with 72,245 of weighted pipe LF of excess capacity. This represents 17.19 percent of the total system. Based on the City's depreciation schedule, the existing system is valued at $5,178,479. However, many of these improvements are project improvements. In addition, only infrastructure with a useable lifespan greater than ten years can be counted towards new development. Once project improvements and non-eligible costs are removed, the remaining system improvement value totals $1,583,599. Based on the calculated excess capacity of 17.19 percent, the buy-in value equals $272,187, as shown below.

Table 3 – Available Excess Capacity

Outfall	Total Acres	Developed Acres	Undeveloped Acres	% of undeveloped	PIPE LOCATION - (LENGTH)	
A10	245.79	185.82	59.97	24.40%	2000 W - (5266')	
					size	length
					42	1090
					30	1878
					24	2298
A14	427.56	387.93	39.63	9.27%	3000 W (800 N to 200 S) – (5172')	
					size	length
					42	2522
					24	2650
A15	314.51	276.14	38.37	12.20%	3335 W (225 N to 200 S) – (2267')	
					size	length
					36	2267
A19	242.84	66.14	176.7	72.76%	4500 W (25 S to 200 S) – (1035')	
					size	length
					24	1035
C5	274.76	97.62	177.14	64.47%	300 N (4500 W to 5000 W) – (2633')	
					size	length
					36	2633
C6	257.57	130.35	127.22	49.39%	800 N (4100 W to 5000 W) – (4709')	
					size	length
					36	277
					24	936
					18	3495
E1	176.55	91.09	85.46	48.41%	4500 W (1300 N to 1550 N) – (1083')	
					size	length
					18	684
					15	399

Table 4 - Excess Capacity Cost Evaluation

Pipe Diameter	Cost	Ratio	Linear Feet (Existing)	LF (Excess Capacity)	Weighted LF (Existing)	Weighted LF (Excess Capacity)
12	$50.00	1.00	32,956	-	32,956	-
15	$60.00	1.20	58,724	399	70,469	479
18	$69.00	1.38	39,553	4,179	54,583	5,767
21	$72.00	1.44	-	-	-	-
24	$75.00	1.50	36,990	6,919	55,484	10,379
27	$80.00	1.60	379	-	607	-
30	$85.00	1.70	10,778	1,878	18,323	3,193
36	$90.00	1.80	15,346	5,177	27,622	9,319
42	$134.00	2.68	4,733	3,612	12,686	9,680
48	$200.00	4.00	1,776	-	7,104	-
		Weighted LF	**279,834**	**38,816**	**420,323**	**72,245**
					Weighted Percent of Total	**17.19%**
					Value of Total System	$5,178,479
					System Improvements	$1,583,599
					Buy-In Valuation	$272,187

Source: LYRB, CFP & IFFP Table 4

G. Land Drain System

One objective to this CFP is to include mapping of the land drain system throughout the City. This data is included in *Appendix D – Land Drain System*. Similar to the existing storm drain system, the existing land drain system data was gathered by City staff and surveyed by Gardner Engineering in order to map for future use. In many instances the land drain flows into storm drain pipes. To account for this flow into the storm drain system, a constant source flow of 0.5 cfs was used. This flow consists of an 8” land drain flowing half full. This estimate was suggested by City Engineer because there is no flow data available on the land drain system.

H. Collection System Analysis

Drainage Basins: The City delineated into 6 different drainage basins A-F. The basins were delineated based on where the basin outfall is located. A map of the drainage basins is shown in *Figure 2 – Drainage Basins*. The following is a description of each basin:

- Basin A – Drains to 200 South County Drain

  The 200 South County Drain originates just south of 300 North and east of 1650 West. A County storm drain pipe flows into the open ditch that runs south to 200 South then west until eventually flowing into the Great Salt Lake. This Basin is the largest basin of the 6. The Basin covers the majority of the eastern portion of the City and continues west through the middle of the City to the western boundary. This basin consists of both developed and largely undeveloped areas.

DEVELOPED AND UNDEVELOPED
WEST POINT IFFP

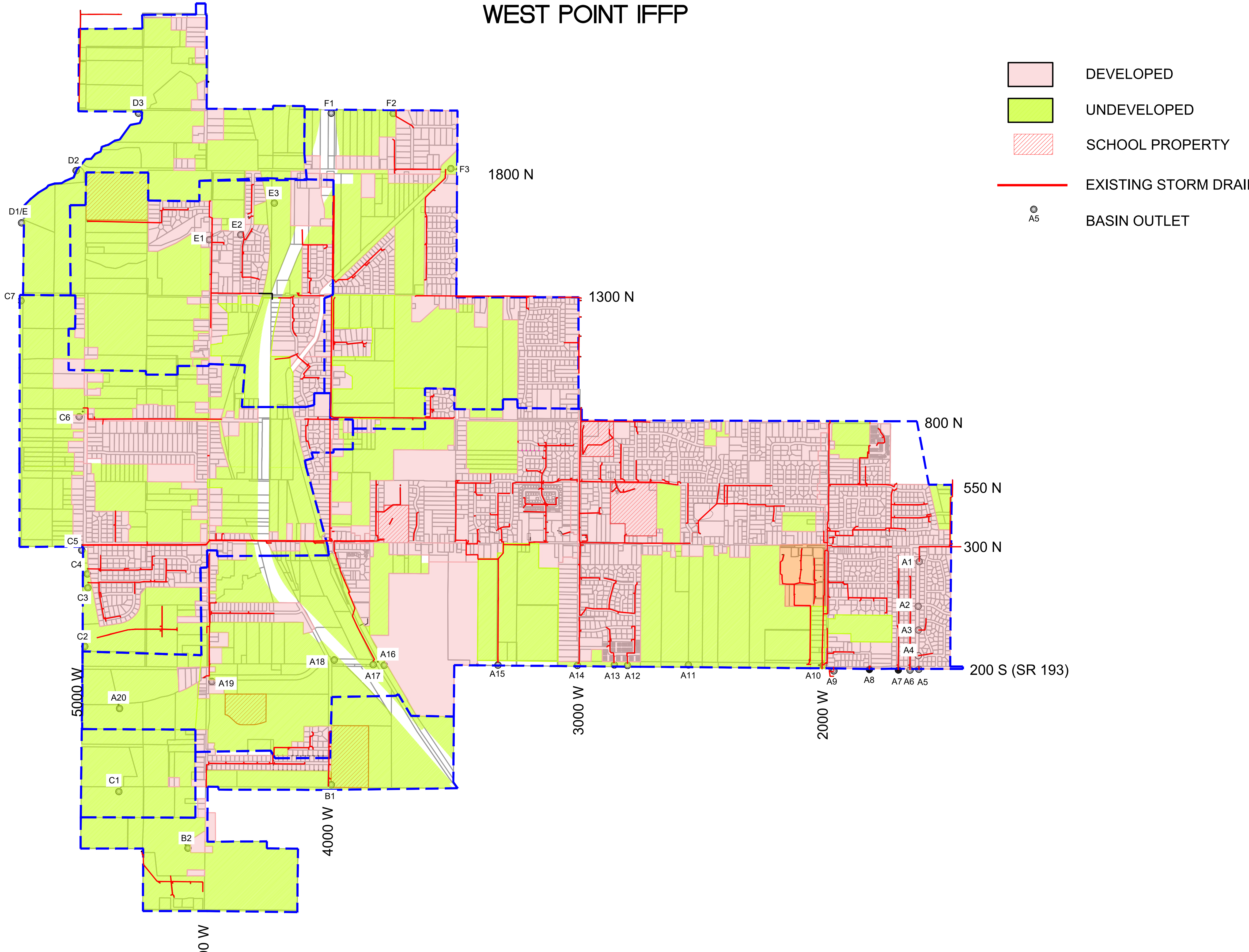

FIGURE 3

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Drafted:	KAN
Checked:	RC

Revisions	
Date	Description

DEVELOPED AND UNDEVELOPED
WEST POINT IFFP
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EX

There are a total of 20 existing and proposed outfalls into the 200 South Drain (Basins A1 – A20). This study analyzes the drainage basins up to the point of the drainage outfall in order to size storm drain pipes throughout the basin. A more detailed study of the 200 South Drain and its contributing areas may be needed to determine capacity of the Drain.

- Basin B – Drains to 700 South County Drain

  The 700 South County Drain runs along the side of 700 South flowing west until 4500 West. From the 4500 West 700 South intersection the Drain flows south along 4500 West until flowing west under 4500 West toward the Great Salt Lake. The open ditch along 4500 West is currently being piped with a 48" HDPE by the County. The majority of Basin B is undeveloped land. This Basin consists of 2 basins that flow into the 700 South Drain (Basins B1 – B2). Based on the capacity of the 700 South Drain and under the direction of Davis County, the release rate for this basin is 0.2 cfs / acre.

- Basin C – Drains to Great Salt Lake

  Basin C consists of much of the land in the western portion of the City. There are 7 basins that flow directly into the Great Salt Lake (Basins C1-C7). The largest of these basins being C5 and C6 are located between 1000 North and 300 North and 4100 West and the Western City Boundary. These Basin outfalls are located at approximately 300 North and 800 North respectively. Basin C consists of both fully developed and undeveloped areas. Future outfall easements maybe necessary as development occurs. The majority of the storm runoff currently flows into the lake unrestricted.

- Basin D – Drains to Howard Slough

  Basin D consists of the northwest corner of the City. The storm water from this basin runs into the Howard Slough. The Howard Slough originates in Weber County and flows southwest until cutting across the northwest part of the City before entering the Great Salt Lake. This basin is almost completely undeveloped and is planned for 0.2 cfs / acre release rates. As development occurs a more detailed approach should be taken in determining flows into the Slough.

- Basin E – Drains to the South Arm of the Howard Slough

  The South Arm of the Howard Slough begins inside of West Point City at approximately 4000 West and 1650 North. The South Arm of the Howard Slough joins up with the main Howard Slough before flowing into the Great Salt Lake. Basin E consists of the area between approximately 4000 West and 5000 West and 1000 North and 1800 North. The area contributing to the South Arm are both developed and undeveloped. Due to storm drain structure limitations in this Slough the County has limited the allowable flow into the South Arm of the Howard Slough to 150 cfs or 0.2 cfs / acre.

- Basin F – Drains to the Clinton Drain

  Basin F consists of 3 basins that drain to the Clinton Drain located north of the City (Basin F1-F3). This basin has both developed and undeveloped areas. Runoff from some of the developed areas is currently detained and some is unrestricted. The undeveloped areas are planned to be detained with a release rate of 0.2 cfs / acre upon development. This study does not analyze the capacity of the Clinton Drain and a more detailed study might be necessary to determine allowable flow from the City to the Clinton Drain. Approval from Davis

County may be needed in order to install the major reach proposed to connect Basin F1 to the Clinton Drain.

Developed and Undeveloped Area: The West Point City General Plan was used to obtain land use densities to apply to areas of the City that are currently undeveloped. Areas of the City that currently have detention ponds were modeled in their current condition taking into account the detention facilities. Runoff was not restricted in subbasins currently close to full buildout and where storm water runoff is not currently being detained.

Areas in the western portion of the City are largely undeveloped. These areas are mostly open fields. For these undeveloped areas where significant development is expected, runoff was limited to an allowable release rate to represent future detention. West Point City currently allows a maximum of 0.2 cfs / acre release rate. Figure 3 shows the areas of developed and undeveloped areas. The undeveloped areas will be allowed to release 0.2 cfs/ acre into the storm drain system.

Results and Recommendations: The modeling software Autodesk Storm and Sanitary was used to create a model of West Point City's storm drainage system. The model was created using a 10-year synthetic storm distribution. A more detailed description of the modeling process and methodology can be found in *Appendix B*. The model was used to model both existing and proposed infrastructure. The results of the model provided peak flows from each subbasin. The results were used to analyze the existing system and indentify deficiencies. Peak flows were also used to plan and size future storm drain infrastructure.

A list was compiled made up of existing undersized pipes, existing problems identified by City staff, and proposed new projects. The *Model Results* list, in *Appendix A – Projects*, shows this list of projects. This list was reviewed in a meeting between Gardner Engineering and West Point City staff. The *Model Results* list was thinned down after the recommendations of the City staff and the results were compiled into a new list of projects. The projects were grouped together as applicable and were assigned project numbers. This list of *Capital Facilities Plan Projects* is shown in *Appendix A – Projects.* The *Capital Facilities Plan Projects* list includes Gardner Engineering project numbers and project descriptions. A map of the City is shown with the projects and numbers on the *Projects Map* in *Appendix A – Projects*. It should be noted that the recommended pipe locations and sizes are all based on the delineated basins and subbasins. Any change from the estimated drainage areas may require pipe sizes and locations to be reevaluated.

Total Cost of Projects Needed At Buildout: Cost estimates were developed using current construction costs. The costs are preliminary estimate of probable construction costs including cost associated with materials and installation, engineering, construction management, and contingency. A cost per foot was developed for each size of storm drain pipe. This cost was applied to the proposed project lengths to determine project costs. Estimates are shown under *Per Foot Cost Estimates* in *Appendix A – Projects.* The total cost of additional expected projects as listed in *Appendix A – Projects* on the *Capital Facilities Plan Projects* list is estimated at $6,066,112.

Total Cost of Impact Fee Eligible Projects Needed At Buildout: As development occurs the existing storm drain system will be required to take on increased flows. In some locations, existing pipelines will need to be upgraded to support the buildout demands. Some projects cannot legally be funded entirely from Impact Fees collected. Each Capital Facilities Plan project was listed with a percentage of the project that is impact fee eligible. *Non-Impact Fee Eligible Projects and Impact Fee Eligible Projects* tables in *Appendix A – Projects* shows the Capital Facilities Plan projects separated based on impact fee eligibility. The total amount of project costs that are eligible for impact fee funding is estimated at $4,280,160. The remaining non-impact fee eligible projects total a cost of $1,785,952.

I. Suggested Capital Improvement Projects

The rate and location of new development will determine which projects the City actually undertakes. Upon review of the Capital Facilities Plan projects, with the City staff, the list was prioritized. The prioritized list was broken down in 5-year increments from 2021 to buildout. The prioritized list is shown on the *Capital Facilities Plan Projects* in *Appendix A – Projects*. This priority schedule is a suggested course of action only and maybe adjusted periodically as future development occurs.

J. Method of Financing Needed Facilities

Impact fees collected shall be used within 6 years of receipt in most cases except as described in Utah Code Section 11-36-302 Impact fees – Expenditure. It is anticipated that the cost of Impact fee eligible projects will be financed through development impact fees where appropriate. In the event that the timing of the rate of collection of impact fees is not sufficient to pay cash for the CFP-related project, outside financing may be sought. Non-impact fee eligible projects will be financed from user fees and taxes, not from impact fees. Non-impact fee projects were recommended by City staff in order to improve maintenance issues with the collection system.

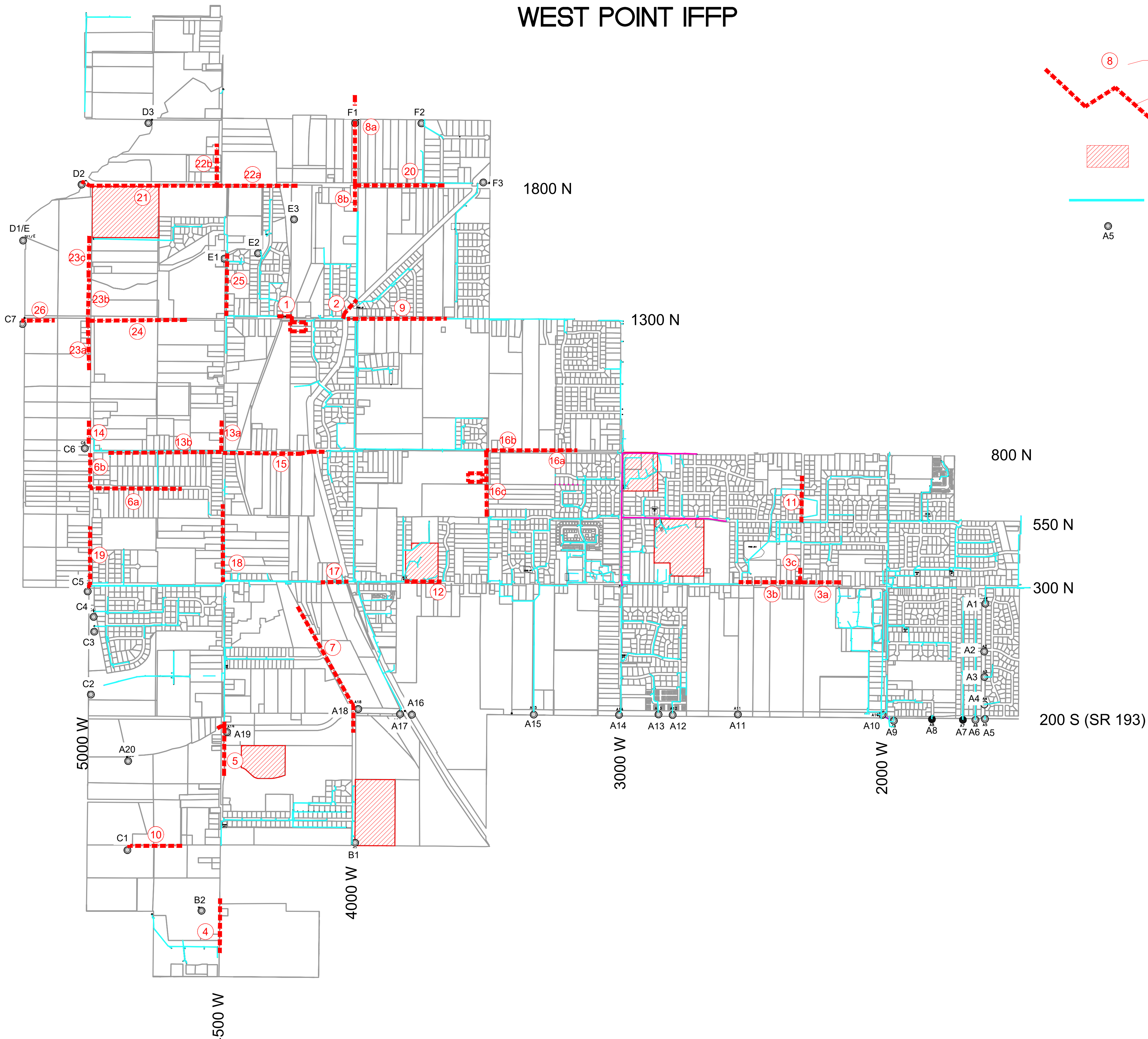
ABBREVIATIONS

AC:	Acre(s)
CFP:	Capital Facilities Plan
EA:	Each
ft:	Feet
LF:	Linear Feet
SD:	Storm Drain
SS:	Sanitary Sewer
WPC:	West Point City
yrs.:	Years

CAPITAL FACILITIES PLAN PROJECTS 2021

Priority Number	Location	Project Description	% Impact Fee Eligible	TOTAL ESTIMATED PROJECT COST 2022-2027	2027-2032	2032-2037	2037-2042	2042-2047	2047-2052	2052-2057	2021 Cost of Impact Fee Eligible Projects
1	1300 N (4150 West to 4300 W)	Connection to eleminate retention pond include siphon and piping	50%	$44,551.81							$22,275.90
2	1300 N (west of canal to Exising 48" pipe)	Connect to exsiting 36" SD under under canal tie to existing 48" SD	80%	$72,614.17							$58,091.34
3a	300 North (west of 2000 West to 2300 West)	New Pipe needed to replace storm drain that flows in irrigation pipe	0%	$90,774.31							$0.00
3b	300 North (2300 West to 2550 West)	New Pipe needed to replace storm drain that flows in irrigation pipe	0%	$150,486.41							$0.00
3c	2300 West	No Storm drain abandon side yard storm drain	0%	$31,743.16							$0.00
4	4500 West (1000 S to 1100 S)	To be detemined as land is developed	100%	$142,492.53							$142,492.53
5	4500 West 210 South to outlet A19	Upsize existing 18" to 24"	90%	$30,993.77							$27,894.39
5	4500 West (250 South to 500 South)	New Pipe needed to replace ditch	90%	$122,116.02							$109,904.42
6a	650 North (4675 West to 5000 West)	New Pipe needed abandon pipe that runs along lot lines Pipe-(165) this pipe is undersized.	0%		$240,070.36						$0.00
6b	5000 West (650 North to 800 North)	New Pipe needed to connect storm drain from 650 North	0%		$91,930.66						$0.00
7	4200 West (300 N to 200 S)	For future roadway improvements	100%		$345,378.66						$345,378.66
8a	4000 West (1800 North to outfall)	No road developed at this time	60%		$535,643.14						$321,385.88
8b	4000 West	Verify there is an existing 48" pipe connect to	70%		$109,095.75						$76,367.03
9	1300 North (3625 West to Layton Canal)	Replace existing ditch with pipe	80%			$301,046.24					$240,837.00
10	700 South (4700 W to Outfall)	To be detemined as land is developed	100%			$142,492.53					$142,492.53
11	2300 West (550 North to 670 North)	No storm drain in roadway	20%			$114,098.31					$22,819.66
12	300 North at West Point Elementary	Connect existing retention pond to storm drain system	0%			$90,045.15					$0.00
13a	4500 West (875 N to 800 North)	New Pipe needed	80%			$75,859.95					$60,687.96
13b	800 North (Canal to Existing 36" Pipe)	Replace existing pipes with 30" Pipe	80%			$325,416.42					$260,333.14
14	5000 West (850 North to 950 North)	New Pipe- replace ditch	100%				$59,886.26				$59,886.26
15	800 North (4150 West to Canal)	Tie Paterson Estates development storm drain that runs in a ditch to canal need to pipe along roadway and under canal	80%				$249,782.78				$199,826.22
16a	800 North (3150 West to Church)	New pipe - replace ditch	95%				$97,569.47				$92,691.00
16b	800 North (Church to 3500 W)	New pipe - replace ditch	95%				$128,358.24				$121,940.32
16c	3500 West to new detention pond	New pipe - replace ditch	95%				$95,744.74				$90,957.51
16c	3500 West outlet of detention pond to 550 N	Pond is needed to reduce flows for connection to existing storm drain	95%				$71,951.17				$68,353.61
17	New Pipe from 4050 W to 4100 W	Replace old pipe	0%				$82,447.34				$0.00
18	4500 West (300 N to 600 North)	Replace exsitng 10" pipe it is under sized	70%					$191,191.76			$133,834.23
19	5000 West (300 North to 550 North)	New Pipe needed to replace ditch (North of 200 South pipe is undersized see model A19)	80%					$162,191.96			$129,753.57
20	1800 North (3675 West to 4000 West)	No curb and gutter storm water runs in ditch	70%					$226,664.35			$158,665.04
21	1800 North (4500 West to 5000 West)	Connect to the Howard Slough (combine 25-1 and 25-2)	100%					$411,480.29			$411,480.29
22a	1800 North (3900 West to 4500 West)	Collect flows east of canal (Part of subbasin D2-1) pipe under canal	100%						$220,767.23		$220,767.23
22b	4500 West (1800 N to 2000 N)	4500 West new pipe	100%						$110,316.80		$110,316.80
23a	5000 West (925 N to 1300 N)	New Pipe- replace ditch	100%						$129,359.58		$129,359.58
23b	5000 West (1300 North to Howard Slough)	New pipe - replace ditch	100%						$127,377.36		$127,377.36
23c	5000 West (1750 N to Howard Slough)	New pipe - replace ditch	100%						$108,346.85		$108,346.85
24	1300 North (4600 West to 5000 West)	New Pipe replace ditch (begin pipe approx 4750 west with 21" depending on development)	100%							$285,643.30	$285,643.30
25	4500 West (1300 N to 1550 N)	Existing pipe is undersized upsize to 30"	80%							$163,505.25	$130,804.20
26	1300 North (5100 West to outfall C7)	New pipe - replace ditch	100%							$86,677.48	$86,677.48
				$685,772.18	$1,322,118.57	$1,048,958.60	$785,740.00	$991,528.35	$696,167.82	$535,826.04	$4,280,159.60
							TOTAL=	$6,066,111.56			

PROJECT OVERVIEW
WEST POINT IFFP



PROJECT ID

PROJECT LOCATION

SCHOOL PROPERTY

EXISTING STORM DRAIN

A5 BASIN OUTLET

Date	Revisions Description

Date: 3-22-21
Scale: Custom
Designed: KAN
Drafted: KAN
Checked: RC

PROJECT OVERVIEW
WEST POINT IFFP
PROJECT ADDRESS
CITY, COUNTY, UTAH

GARDNER ENGINEERING
CIVIL • LAND PLANNING
MUNICIPAL • LAND SURVEYING
5150 SOUTH 375 EAST OGDEN, UT
OFFICE: 801.476.0202 FAX: 801.476.0066

P1

R:\WEST POINT\STORM DRAIN IFFP_2019\DESIGN\DWG\WESTPOINTSTORMDRAIN2021_KAN.DWG

Per Foot Cost Estimate - Storm Drain

1/7/2011

12" RCP					
Description	**Quantity**	**Quantity Per Foot of Pipe**	**Unit Price**	**Unit**	**Total Cost Per Foot of Pipe**
12" RCP		1	$ 50.00	LF	$ 50.00
Catch Basins w/ Laterals	**2** per 500 ft	0.004	$ 3,000.00	EA	$ 12.00
SD Manhole	1 per 500 ft	0.002	$ 2,500.00	EA	$ 5.00
Pipe Bedding Sand	Full Length - 6"D x 3'W	0.075		TON	$ -
Granular Fill	50% Length - 6'D x 5'W	1.05		TON	$ -
Asphalt Patch	50% Length - 4"D x 6'W	0.074925	$ 80.00	TON	$ 5.99
Signage and Flagging	1 Per 2000 ft	0.0005	$ 3,500.00	LS	$ 1.75
Engineering	8%				$ 5.98
Construction Management	5%				$ 3.74
Contingency	20%				$ 14.95
Total					**$ 99.41**

15" RCP					
Description	**Quantity**	**Quantity Per Foot of Pipe**	**Unit Price**	**Unit**	**Total Cost Per Foot of Pipe**
15" RCP		1	$ 60.00	LF	$ 60.00
Catch Basins w/ Laterals	**2** per 500 ft	0.004	$ 2,500.00	EA	$ 10.00
SD Manhole	1 per 500 ft	0.002	$ 3,000.00	EA	$ 6.00
Pipe Bedding Sand	Full Length - 6"D x 3'W	0.075		TON	$ -
Granular Fill	50% Length - 6'D x 5'W	1.05		TON	$ -
Asphalt Patch	50% Length - 4"D x 6'W	0.074925	$ 80.00	TON	$ 5.99
Signage and Flagging	1 Per 2000 ft	0.0005	$ 3,500.00	LS	$ 1.75
Engineering	8%				$ 6.70
Construction Management	5%				$ 4.19
Contingency	20%				$ 16.75
Total					**$ 111.38**

18" RCP					
Description	**Quantity**	**Quantity Per Foot of Pipe**	**Unit Price**	**Unit**	**Total Cost Per Foot of Pipe**
18" RCP		1	$ 69.00	LF	$ 69.00
Catch Basins w/ Laterals	**2** per 500 ft	0.004	$ 2,500.00	EA	$ 10.00
SD Manhole	1 per 500 ft	0.002	$ 3,000.00	EA	$ 6.00
Pipe Bedding Sand	Full Length - 6"D x 3'W	0.075	$ -	TON	$ -
Granular Fill	50% Length - 6'D x 5'W	1.05	$ -	TON	$ -
Asphalt Patch	50% Length - 4"D x 6'W	0.074925	$ 80.00	TON	$ 5.99
Signage and Flagging	1 Per 2000 ft	0.0005	$ 3,500.00	LS	$ 1.75
Engineering	8%				$ 7.42
Construction Management	5%				$ 4.64
Contingency	20%				$ 18.55
Total					**$ 123.35**

21" RCP					
Description	**Quantity**	**Quantity Per Foot of Pipe**	**Unit Price**	**Unit**	**Total Cost Per Foot of Pipe**
21" RCP		1	$ 72.00	LF	$ 72.00
Catch Basins w/ Laterals	**2** per 500 ft	0.004	$ 2,500.00	EA	$ 10.00
SD Manhole	1 per 500 ft	0.002	$ 3,000.00	EA	$ 6.00
Pipe Bedding Sand	Full Length - 6"D x 3'W	0.075		TON	$ -
Granular Fill	50% Length - 6'D x 5'W	1.05		TON	$ -
Asphalt Patch	50% Length - 4"D x 6'W	0.074925	$ 80.00	TON	$ 5.99
Signage and Flagging	1 Per 2000 ft	0.0005	$ 3,500.00	LS	$ 1.75
Engineering	8%				$ 7.66
Construction Management	5%				$ 4.79
Contingency	20%				$ 19.15
Total					**$ 127.34**

24" RCP					
Description	**Quantity**	**Quantity Per Foot of Pipe**	**Unit Price**	**Unit**	**Total Cost Per Foot of Pipe**
24" RCP		1	$ 75.00	LF	$ 75.00
Catch Basins w/ Laterals	**2** per 500 ft	0.004	$ 2,500.00	EA	$ 10.00
SD Manhole	1 per 500 ft	0.002	$ 3,000.00	EA	$ 6.00
Pipe Bedding Sand	Full Length - 6"D x 3'W	0.075		TON	$ -
Granular Fill	50% Length - 6'D x 5'W	1.05		TON	$ -
Asphalt Patch	50% Length - 4"D x 6'W	0.074925	$ 80.00	TON	$ 5.99
Signage and Flagging	1 Per 2000 ft	0.0005	$ 3,500.00	LS	$ 1.75
Engineering	8%				$ 7.90
Construction Management	5%				$ 4.94
Contingency	20%				$ 19.75
Total					**$ 131.33**

27" RCP					
Description	**Quantity**	**Quantity Per Foot of Pipe**	**Unit Price**	**Unit**	**Total Cost Per Foot of Pipe**
27" RCP		1	$ 80.00	LF	$ 80.00
Catch Basins w/ Laterals	**2** per 500 ft	0.004	$ 2,500.00	EA	$ 10.00
SD Manhole	1 per 500 ft	0.002	$ 3,000.00	EA	$ 6.00
Pipe Bedding Sand	Full Length - 6"D x 3'W	0.075		TON	$ -
Granular Fill	50% Length - 6'D x 5'W	1.05		TON	$ -
Asphalt Patch	50% Length - 4"D x 6'W	0.074925	$ 80.00	TON	$ 5.99
Signage and Flagging	1 Per 2000 ft	0.0005	$ 3,500.00	LS	$ 1.75
Engineering	8%				$ 8.30
Construction Management	5%				$ 5.19
Contingency	20%				$ 20.75
Total					**$ 137.98**

30" RCP					
Description	**Quantity**	**Quantity Per Foot of Pipe**	**Unit Price**	**Unit**	**Total Cost Per Foot of Pipe**
30" RCP		1	$ 85.00	LF	$ 85.00
Catch Basins w/ Laterals	**2** per 500 ft	0.004	$ 2,500.00	EA	$ 10.00
SD Manhole	1 per 500 ft	0.002	$ 3,000.00	EA	$ 6.00
Pipe Bedding Sand	Full Length - 6"D x 3'W	0.075		TON	$ -
Granular Fill	50% Length - 6'D x 5'W	1.05		TON	$ -
Asphalt Patch	50% Length - 4"D x 6'W	0.074925	$ 80.00	TON	$ 5.99
Signage and Flagging	1 Per 2000 ft	0.0005	$ 3,500.00	LS	$ 1.75
Engineering	8%				$ 8.70
Construction Management	5%				$ 5.44
Contingency	20%				$ 21.75
Total					**$ 144.63**

36" RCP					
Description	**Quantity**	**Quantity Per Foot of Pipe**	**Unit Price**	**Unit**	**Total Cost Per Foot of Pipe**
36" RCP		1	$ 90.00	LF	$ 90.00
Catch Basins w/ Laterals	**2** per 500 ft	0.004	$ 2,500.00	EA	$ 10.00
SD Manhole	1 per 500 ft	0.002	$ 3,000.00	EA	$ 6.00
Pipe Bedding Sand	Full Length - 6"D x 3'W	0.075		TON	$ -
Granular Fill	50% Length - 6'D x 5'W	1.05		TON	$ -
Asphalt Patch	50% Length - 4"D x 6'W	0.074925	$ 80.00	TON	$ 5.99
Signage and Flagging	1 Per 2000 ft	0.0005	$ 3,500.00	LS	$ 1.75
Engineering	8%				$ 9.10
Construction Management	5%				$ 5.69
Contingency	20%				$ 22.75
Total					**$ 151.28**

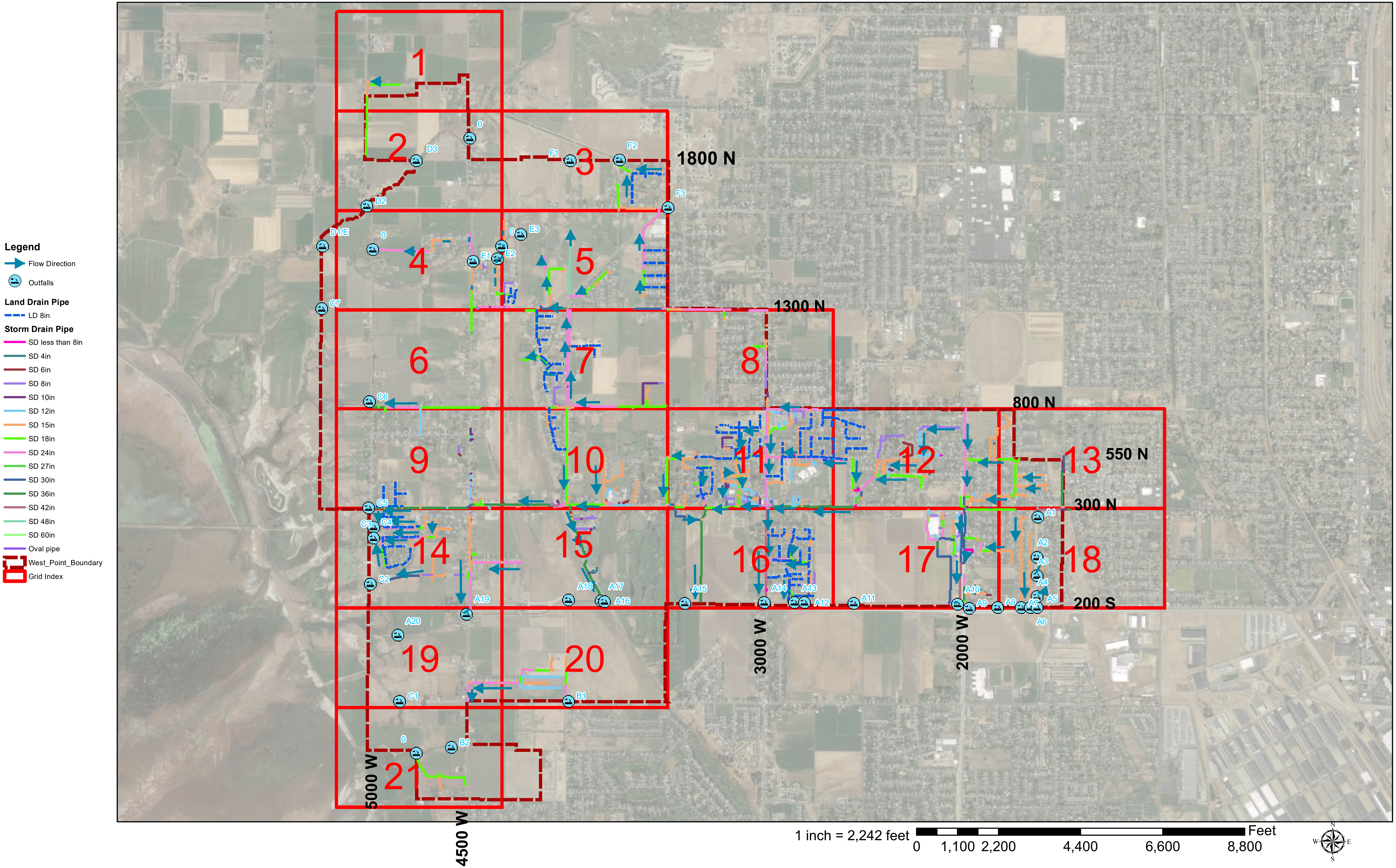
42" RCP					
Description	**Quantity**	**Quantity Per Foot of Pipe**	**Unit Price**	**Unit**	**Total Cost Per Foot of Pipe**
42" RCP		1	$ 134.00	LF	$ 134.00
Catch Basins w/ Laterals	**2** per 500 ft	0.004	$ 2,500.00	EA	$ 10.00
SD Manhole	1 per 500 ft	0.002	$ 3,000.00	EA	$ 6.00
Pipe Bedding Sand	Full Length - 6"D x 3'W	0.075		TON	$ -
Granular Fill	50% Length - 6'D x 5'W	1.05		TON	$ -
Asphalt Patch	50% Length - 4"D x 6'W	0.074925	$ 80.00	TON	$ 5.99
Signage and Flagging	1 Per 2000 ft	0.0005	$ 3,500.00	LS	$ 1.75
Engineering	8%				$ 12.62
Construction Management	5%				$ 7.89
Contingency	20%				$ 31.55
Total					**$ 209.80**

48" RCP					
Description	**Quantity**	**Quantity Per Foot of Pipe**	**Unit Price**	**Unit**	**Total Cost Per Foot of Pipe**
48" RCP		1	$ 200.00	LF	$ 200.00
Catch Basins w/ Laterals	**2** per 500 ft	0.004	$ 2,500.00	EA	$ 10.00
SD Manhole	1 per 500 ft	0.002	$ 3,000.00	EA	$ 6.00
Pipe Bedding Sand	Full Length - 6"D x 3'W	0.075		TON	$ -
Granular Fill	50% Length - 6'D x 5'W	1.05		TON	$ -
Asphalt Patch	50% Length - 4"D x 6'W	0.074925	$ 80.00	TON	$ 5.99
Signage and Flagging	1 Per 2000 ft	0.0005	$ 3,500.00	LS	$ 1.75
Engineering	8%				$ 17.90
Construction Management	5%				$ 11.19
Contingency	20%				$ 44.75
Total					**$ 297.58**

APPENDIX B

Storm Drain System

West Point Storm Drain Overview



West Point Storm Drain 2021 **Page 1 of 21**

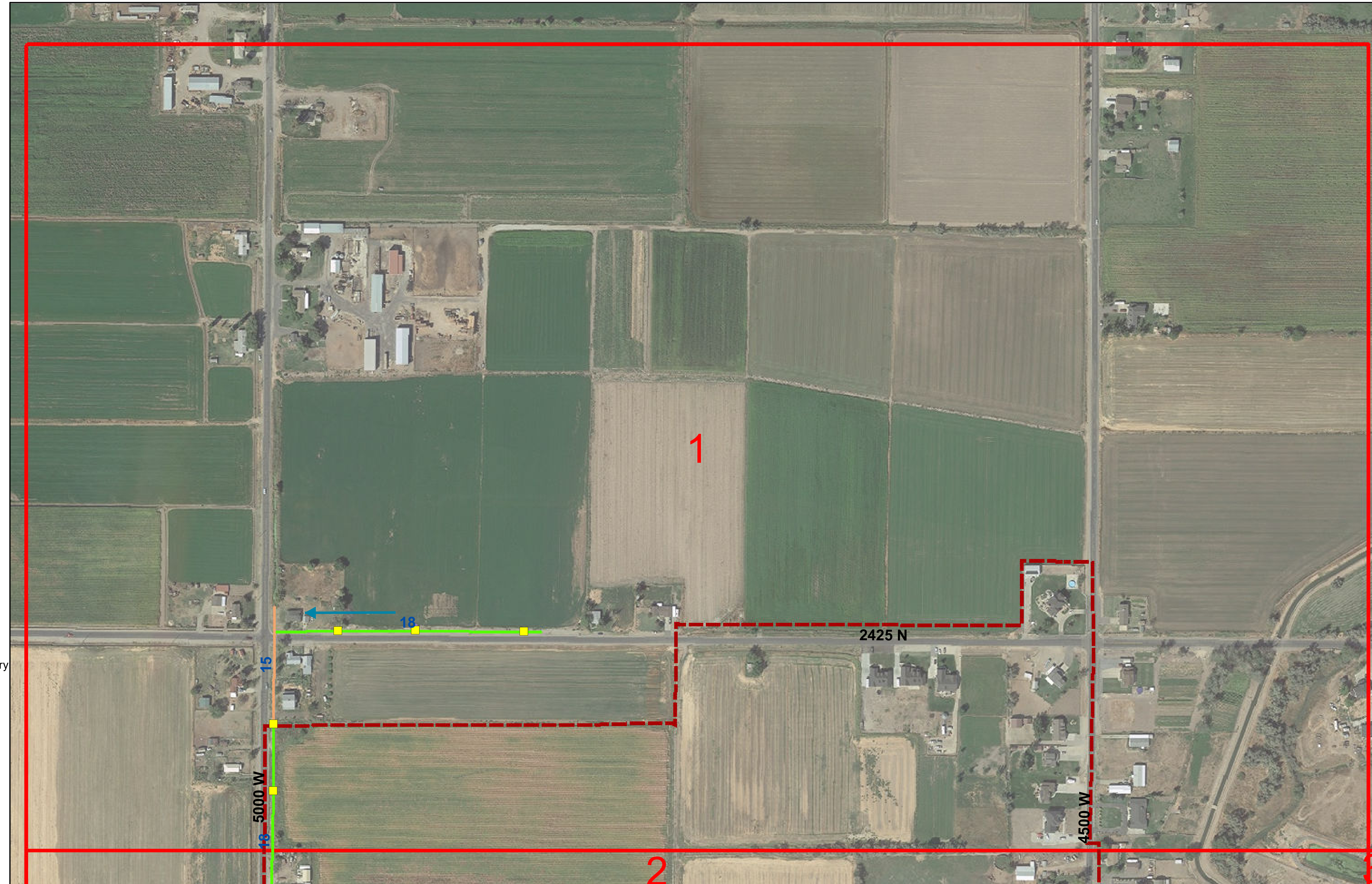
Legend

Flow Direction

Storm Drain
- SDCB
- SDMH
- Access Box
- SDBOX
- Control Structure
- DRAIN
- OPEN BOX
- OVERFLOW BOX
- Outfalls

Land Drain Pipe
- LD 8in

Storm Drain Pipe
- SD less than 8in
- SD 4in
- SD 6in
- SD 8in
- SD 10in
- SD 12in
- SD 15in
- SD 18in
- SD 24in
- SD 27in
- SD 30in
- SD 36in
- SD 42in
- SD 48in
- SD 60in
- Oval pipe
- West_Point_Boundary
- Grid Index



1 inch = 300 feet

0 150 300 600 900 1,200 Feet

West Point Storm Drain 2021

Legend

- Flow Direction

Storm Drain

- SDCB
- SDMH
- Access Box
- SDBOX
- Control Structure
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- SD 48in
- SD 60in
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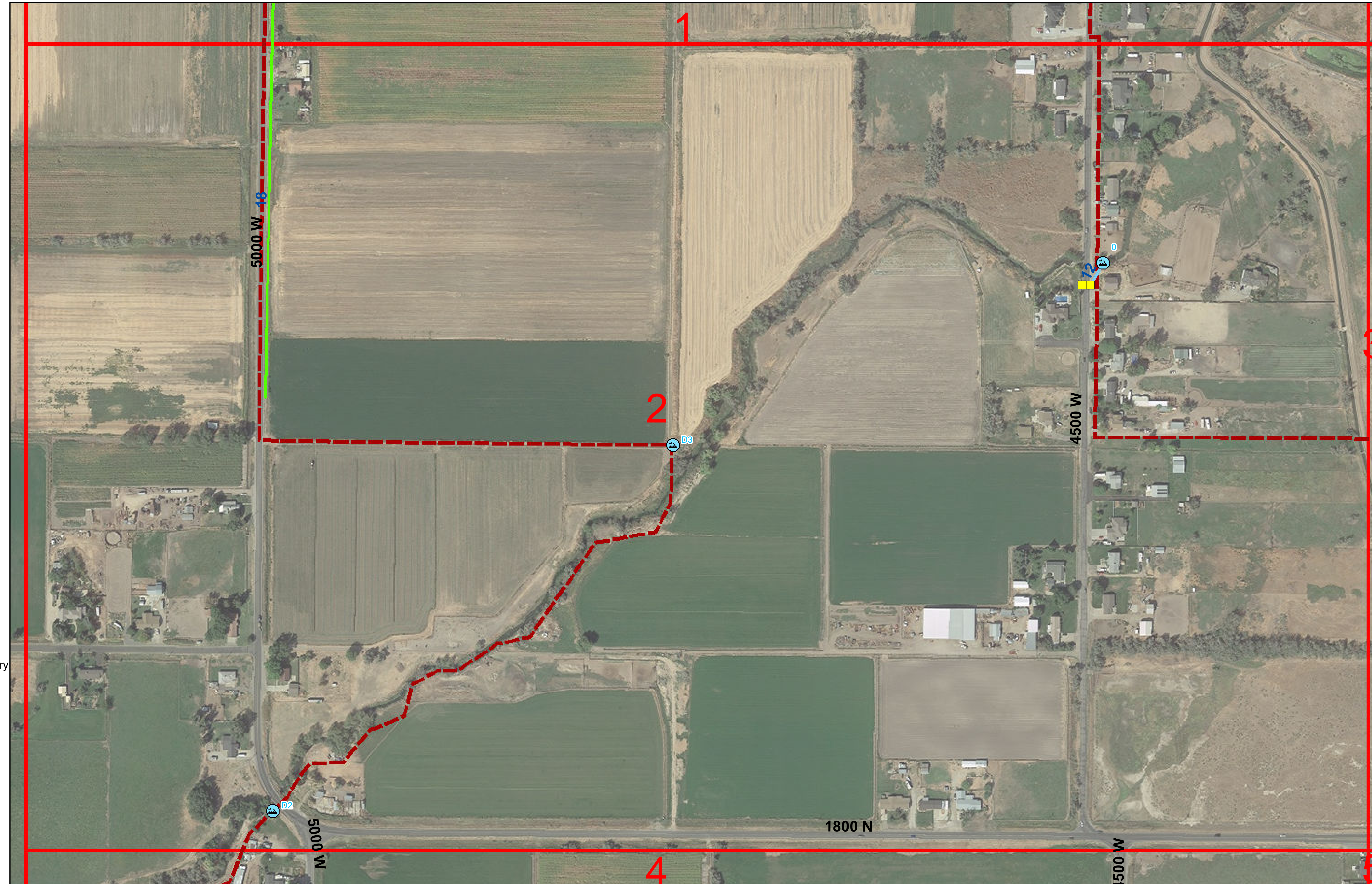
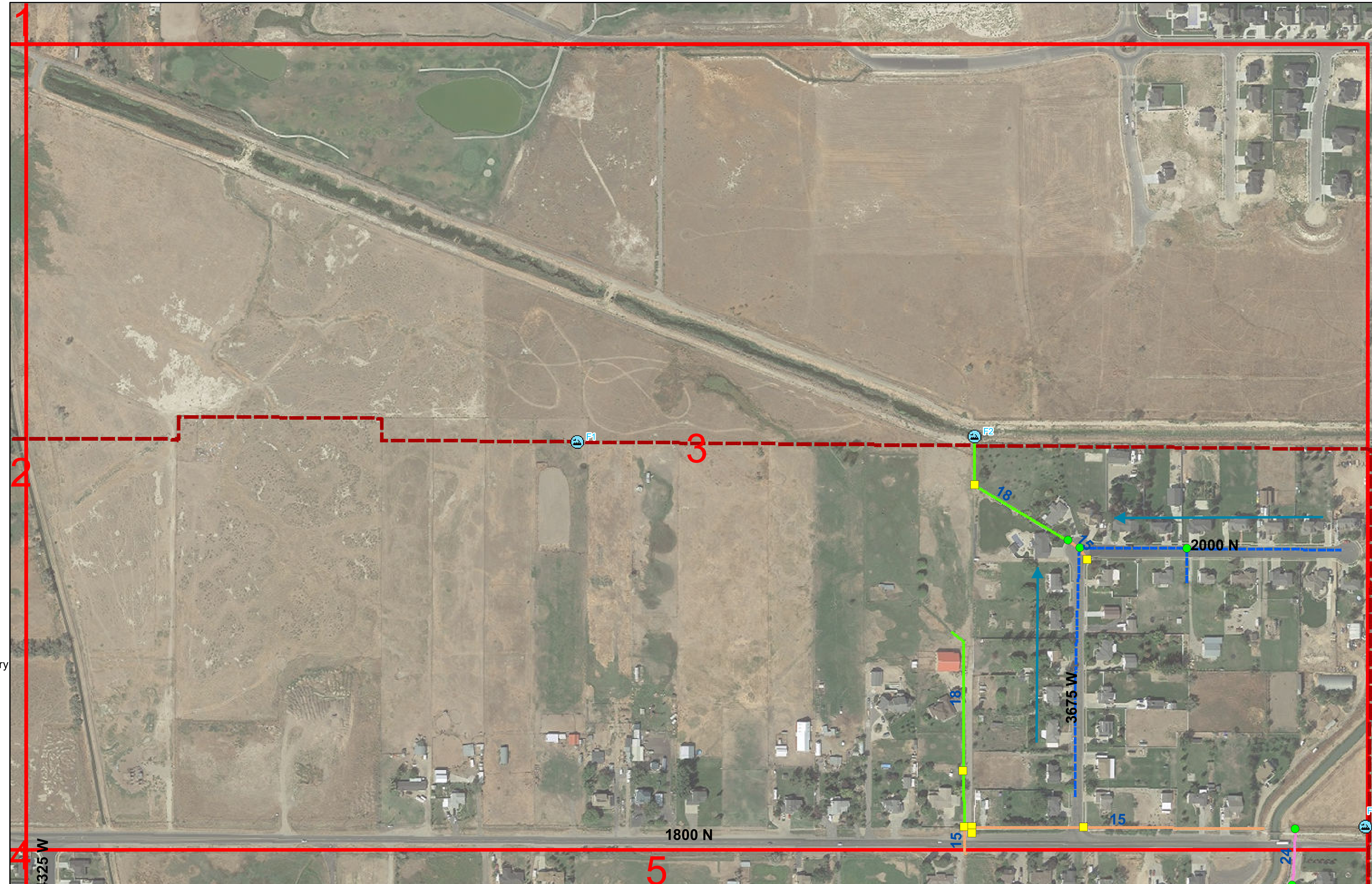


1 inch = 300 feet

0 150 300 600 900 1,200 Feet

West Point Storm Drain 2021



Legend

- Flow Direction

Storm Drain

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- Access Box
- SDBOX
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- OVERFLOW BOX
- Outfalls

Land Drain Pipe

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Storm Drain Pipe

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- SD 24in
- SD 27in
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- SD 48in
- SD 60in
- Oval pipe
- West_Point_Boundary
- Grid Index

1 inch = 300 feet

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West Point Storm Drain 2021

Legend
- Flow Direction

Storm Drain
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- SD 60in
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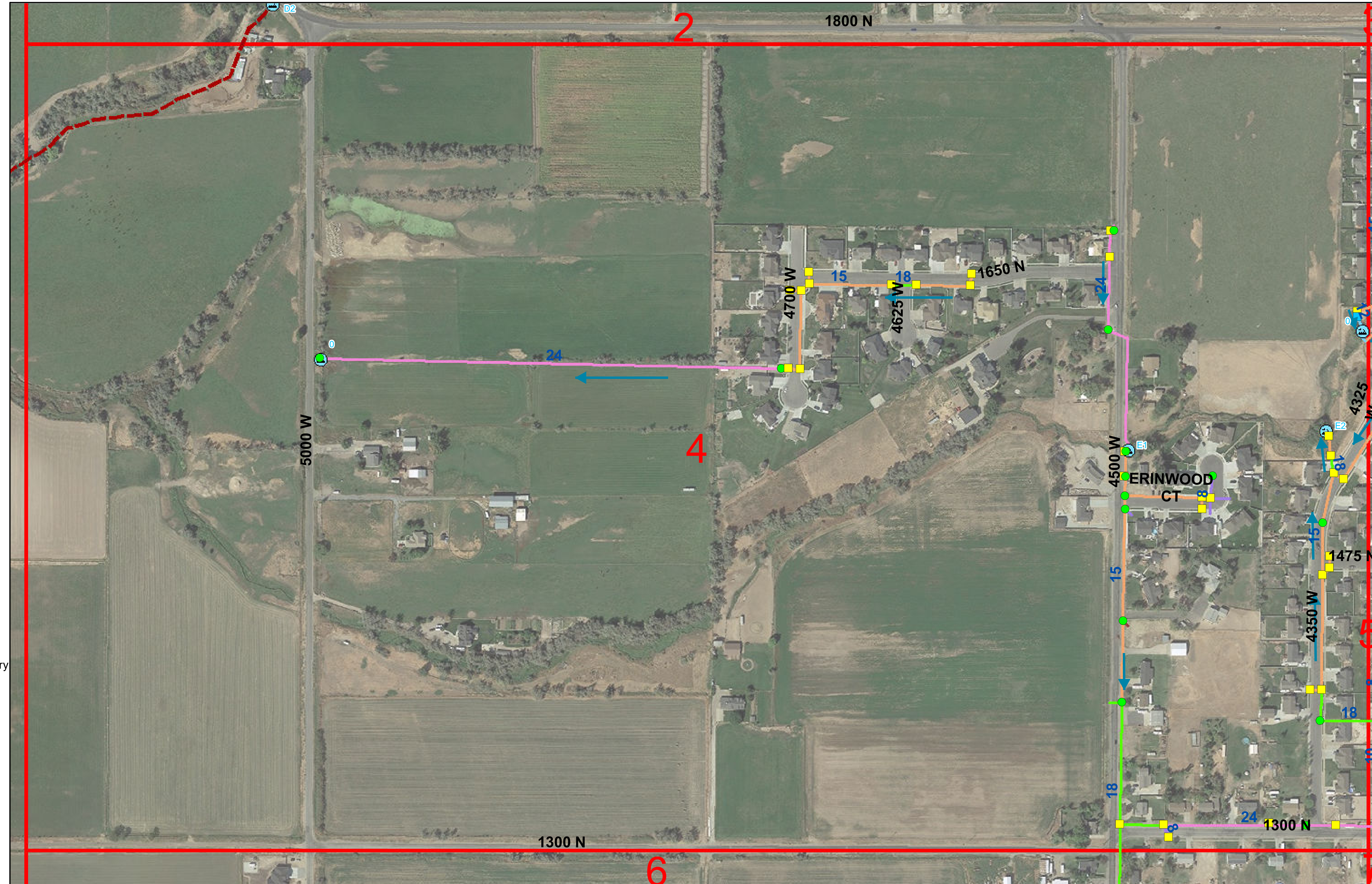
- Grid Index



1 inch = 300 feet

0 150 300 600 900 1,200 Feet

West Point Storm Drain 2021

Legend

- Flow Direction

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- SD 24in
- SD 27in
- SD 36in
- SD 42in
- SD 48in
- SD 60in
- Oval pipe
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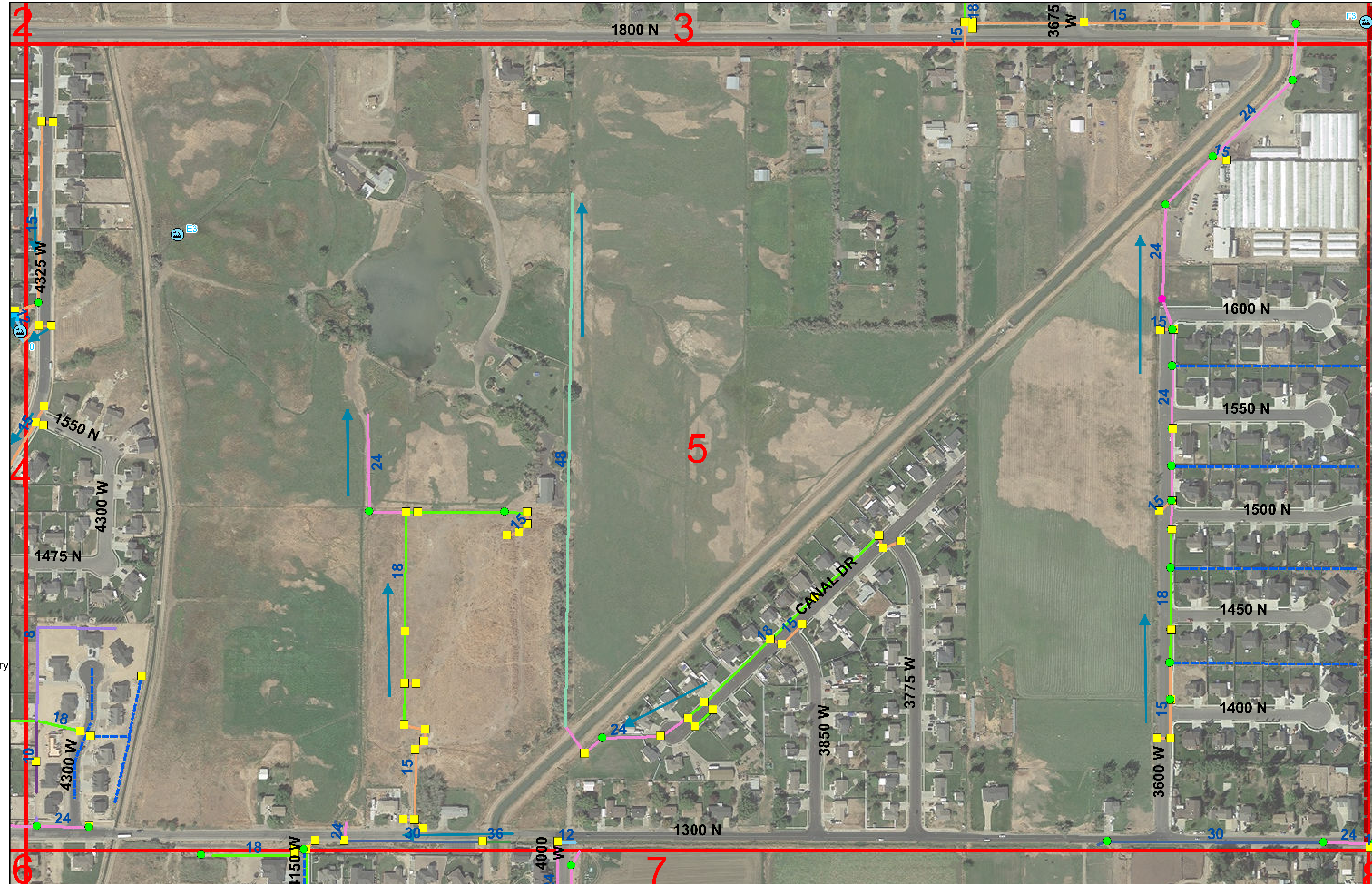

1 inch = 300 feet

0 150 300 600 900 1,200 Feet

West Point Storm Drain 2021

Legend

Flow Direction

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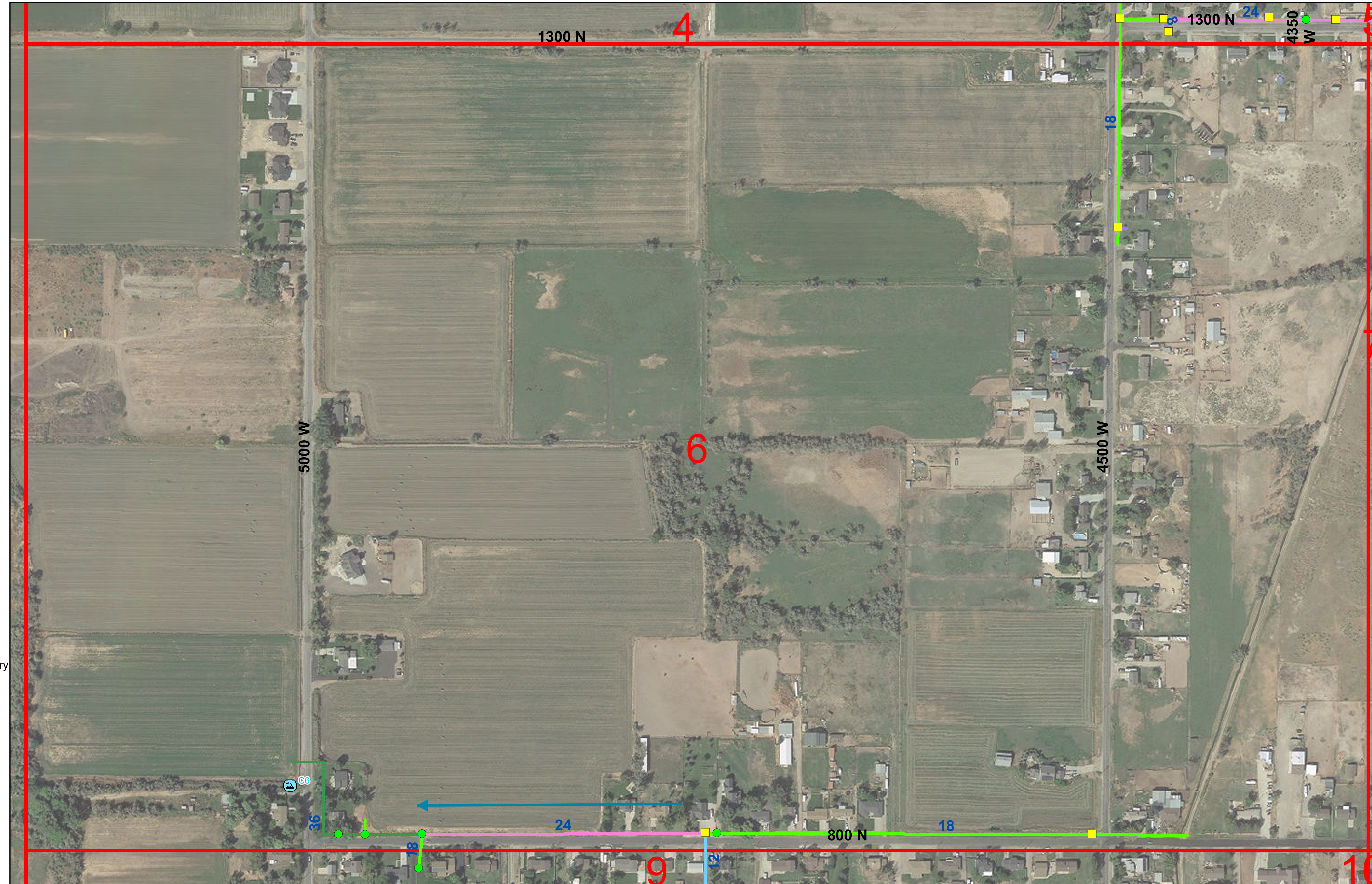
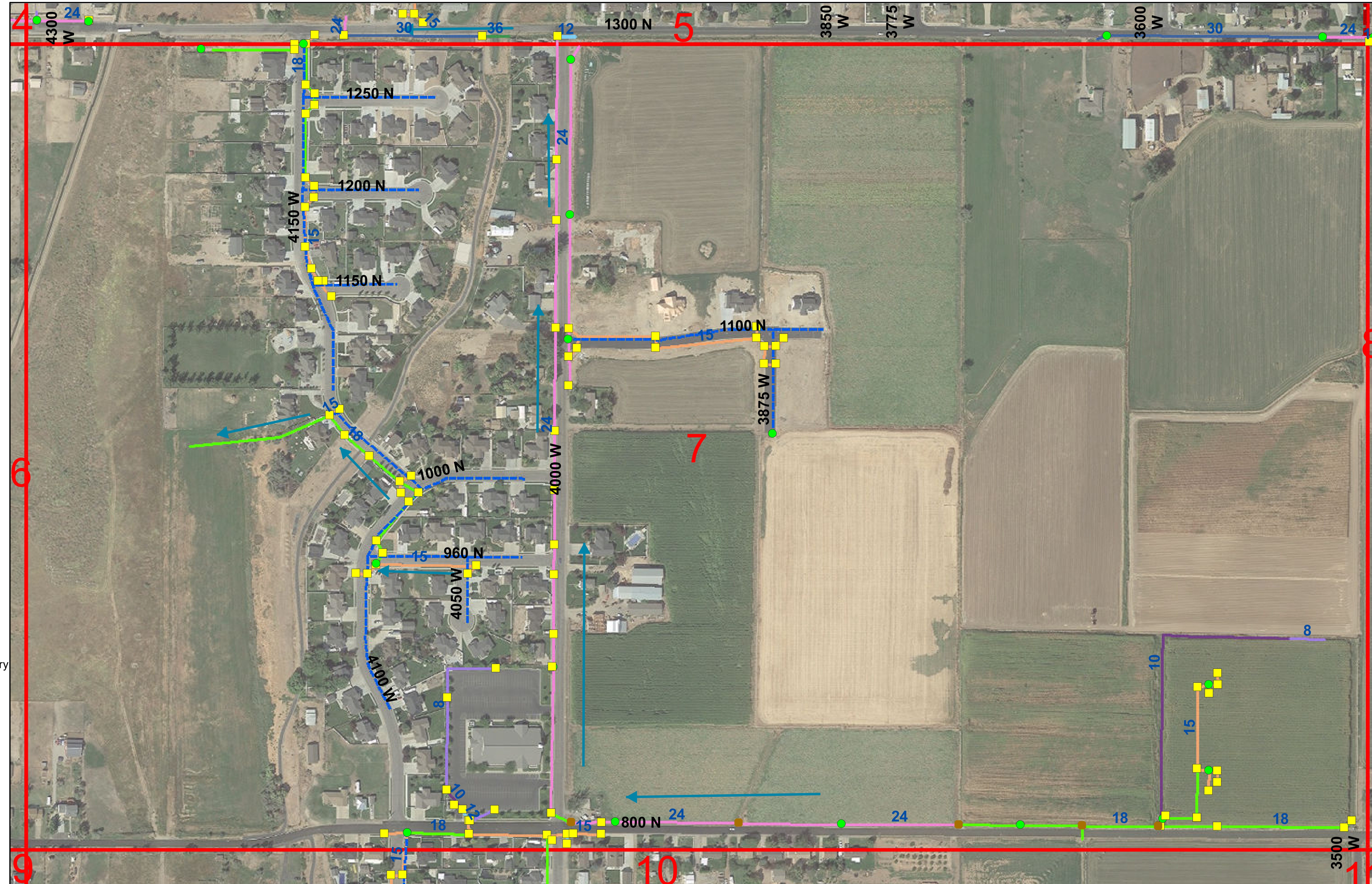


1 inch = 300 feet

0 150 300 600 900 1,200 Feet

West Point Storm Drain 2021



Legend

- Flow Direction

Storm Drain

- SDCB
- SDMH
- Access Box
- SDBOX
- Control Structure
- DRAIN
- OPEN BOX
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- Outfalls

Land Drain Pipe

- LD 8in

Storm Drain Pipe

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1 inch = 300 feet

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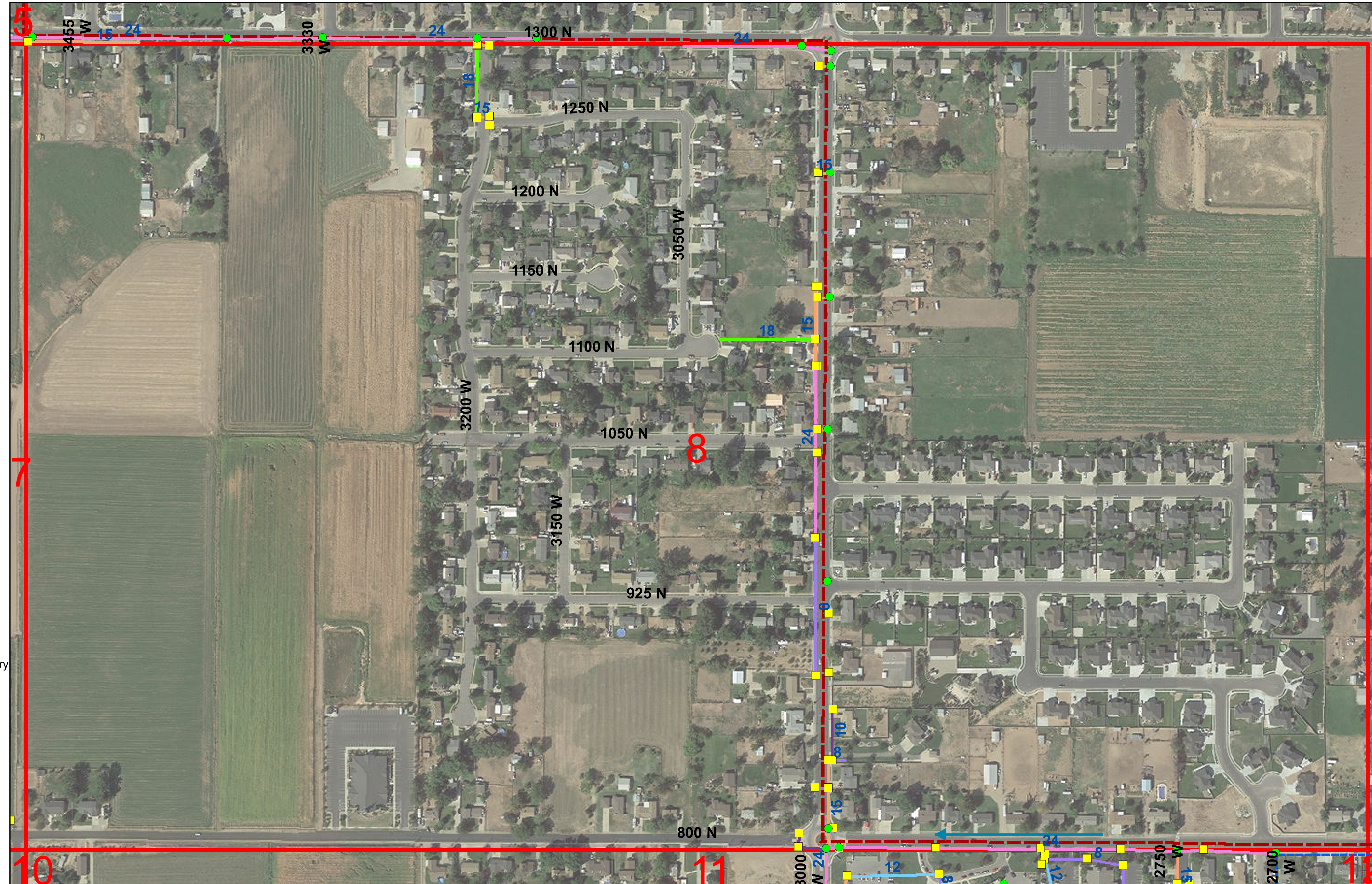

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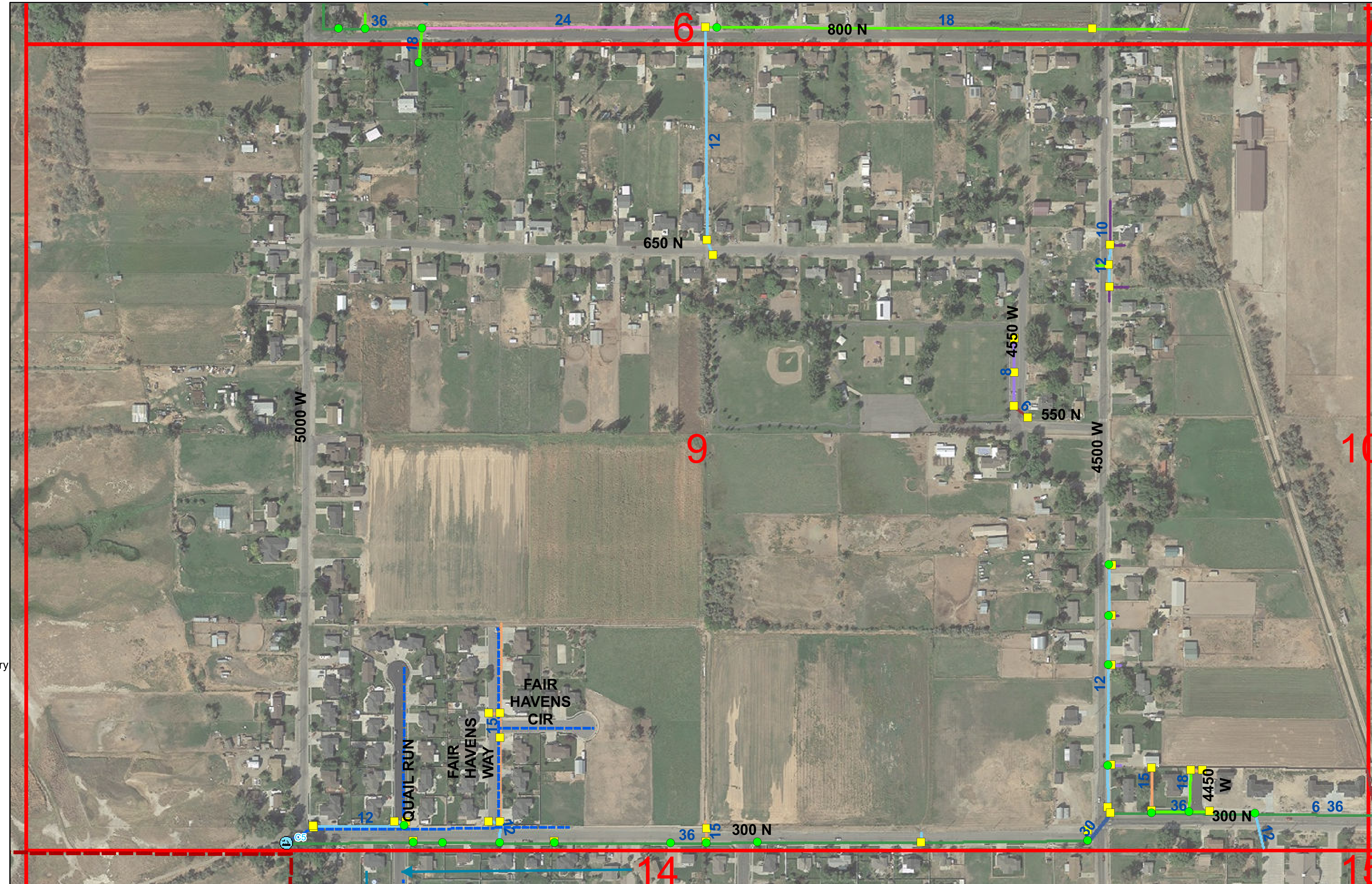

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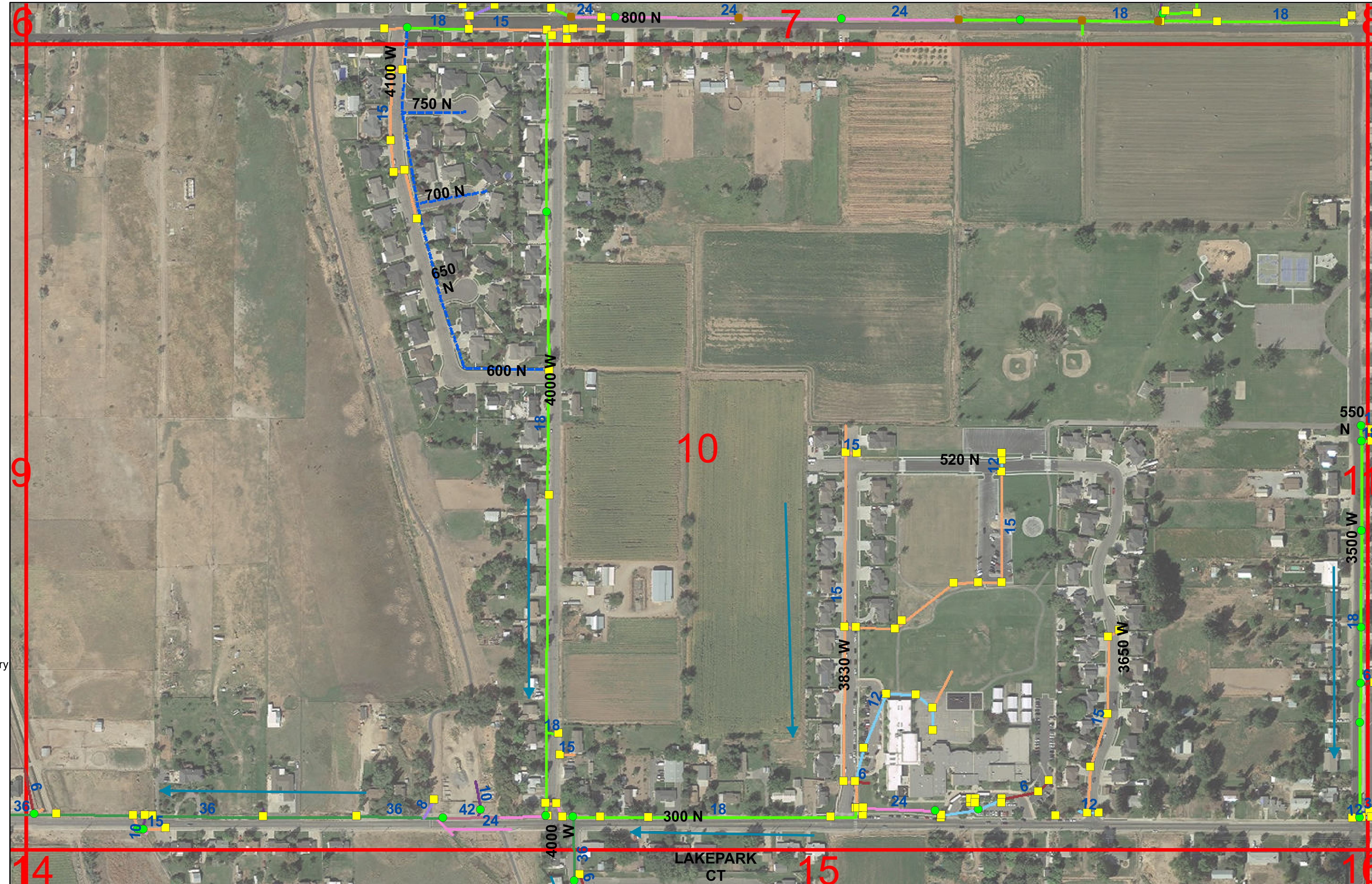

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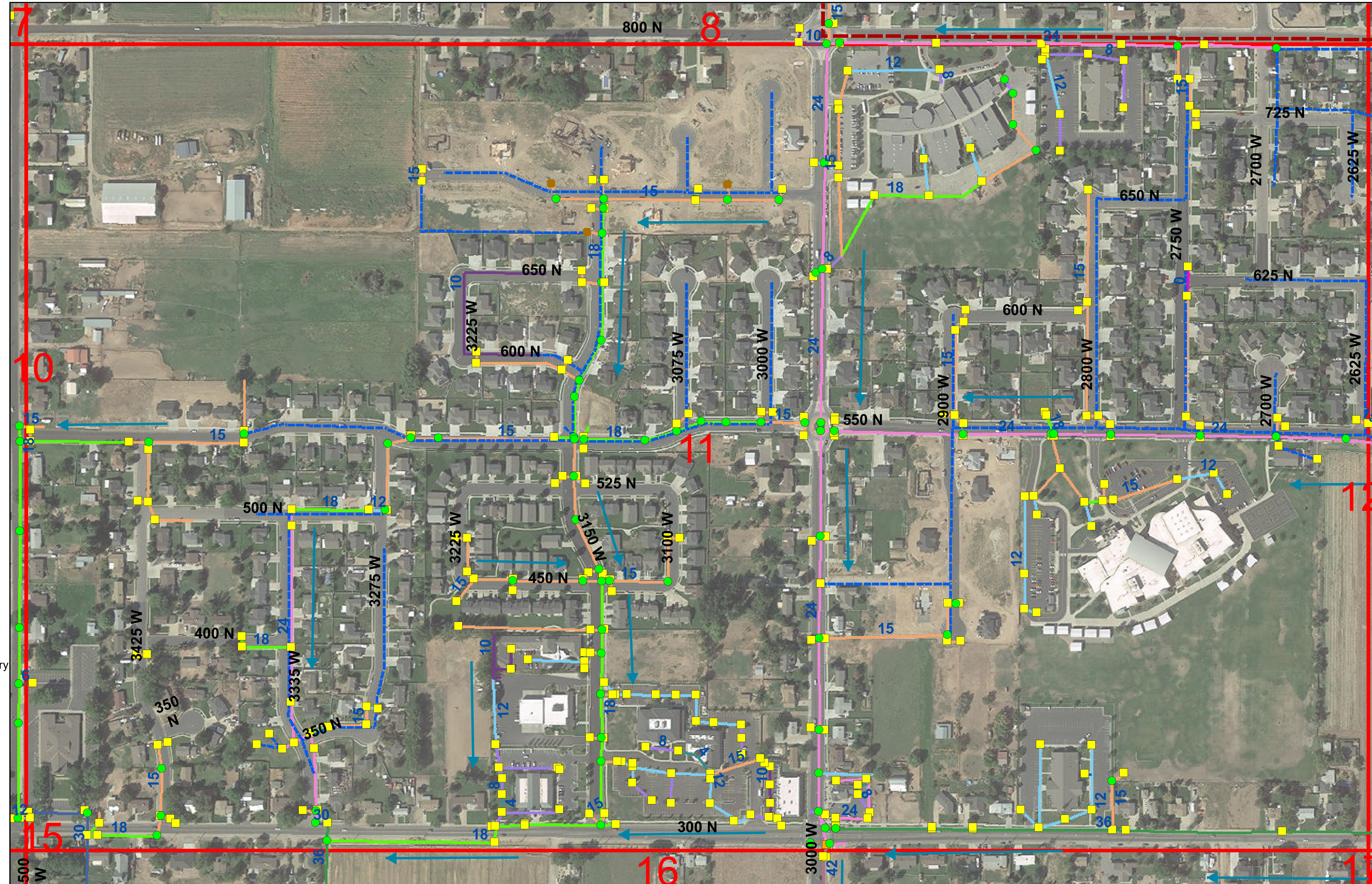

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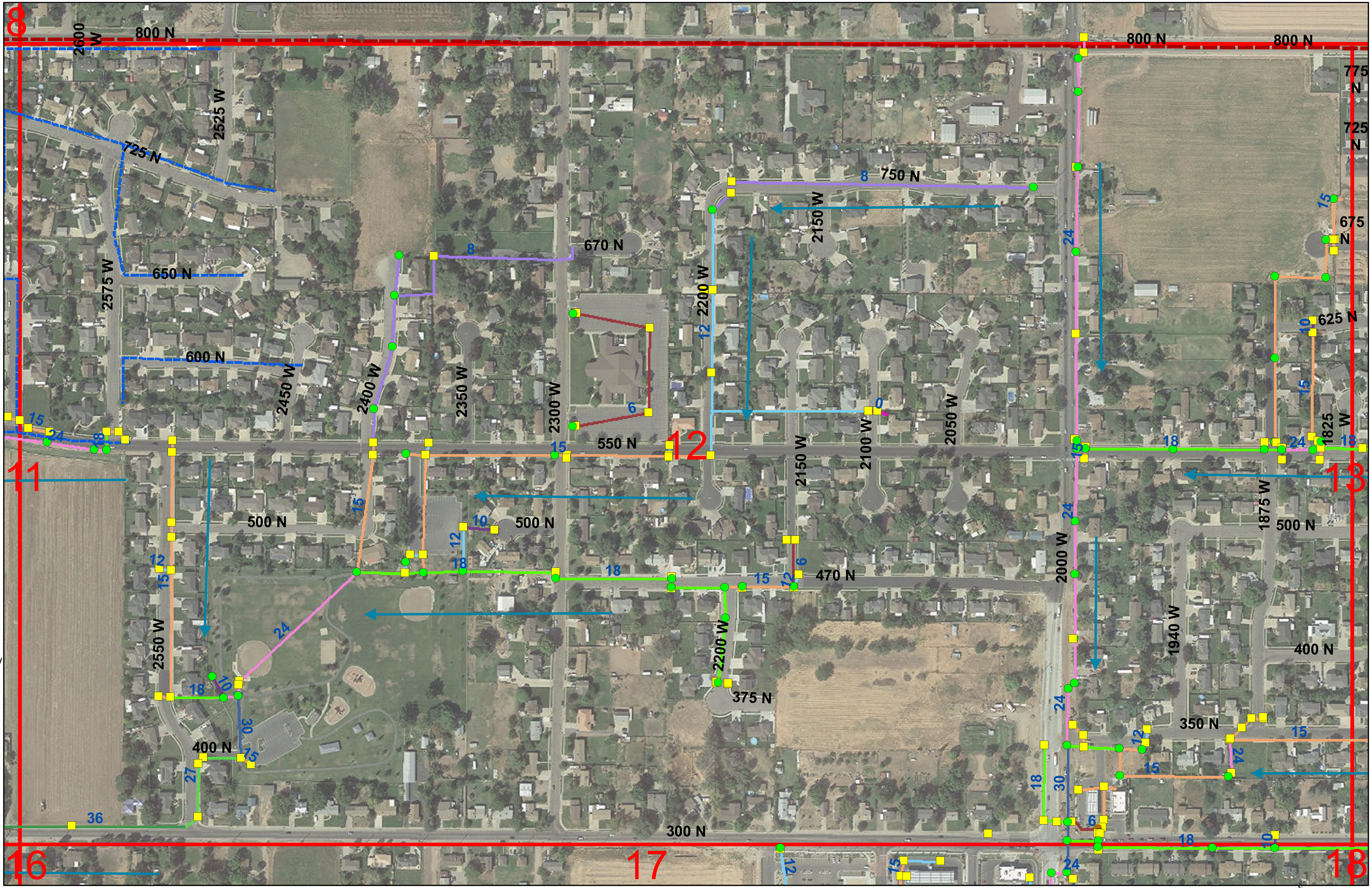

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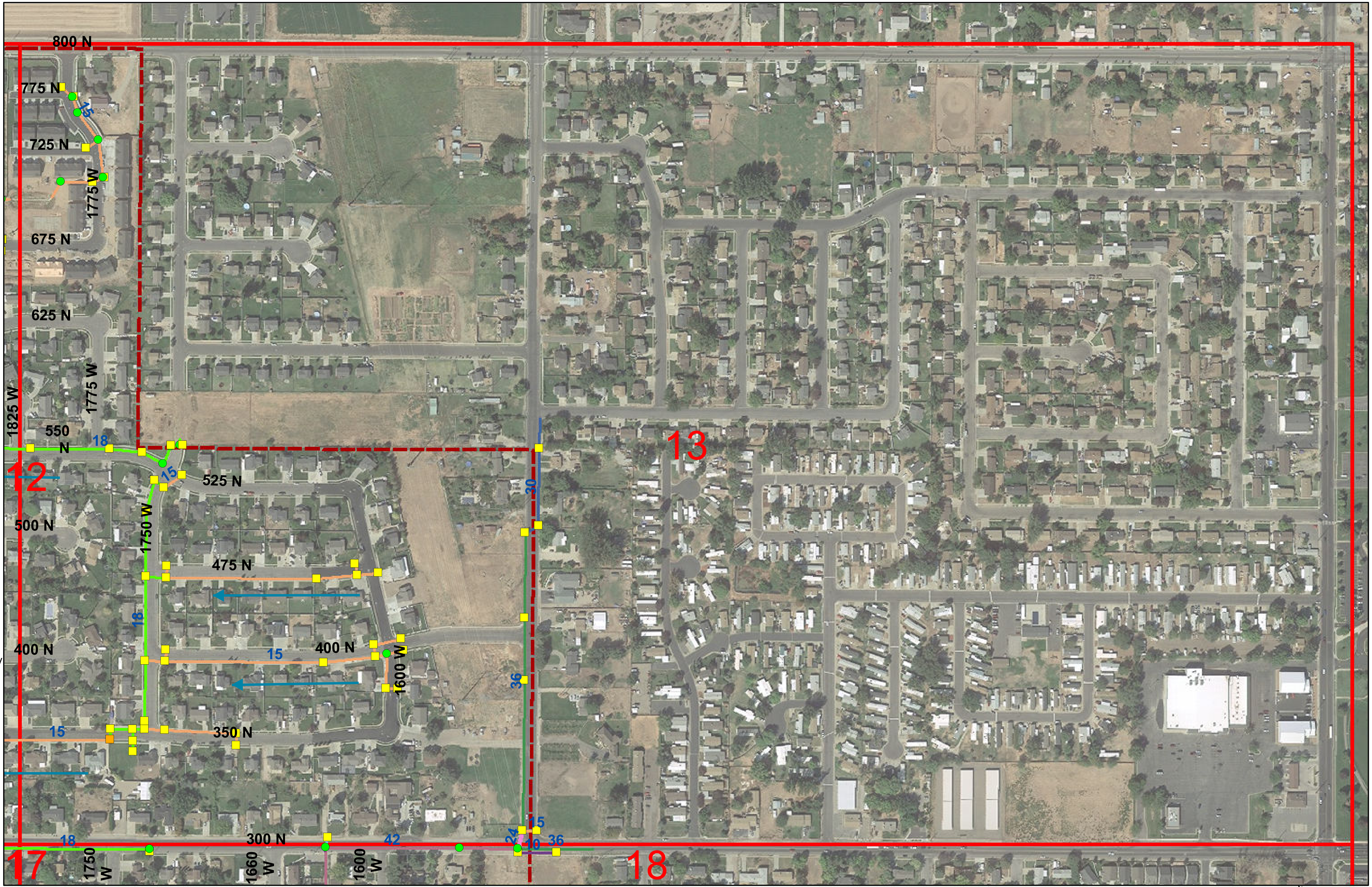

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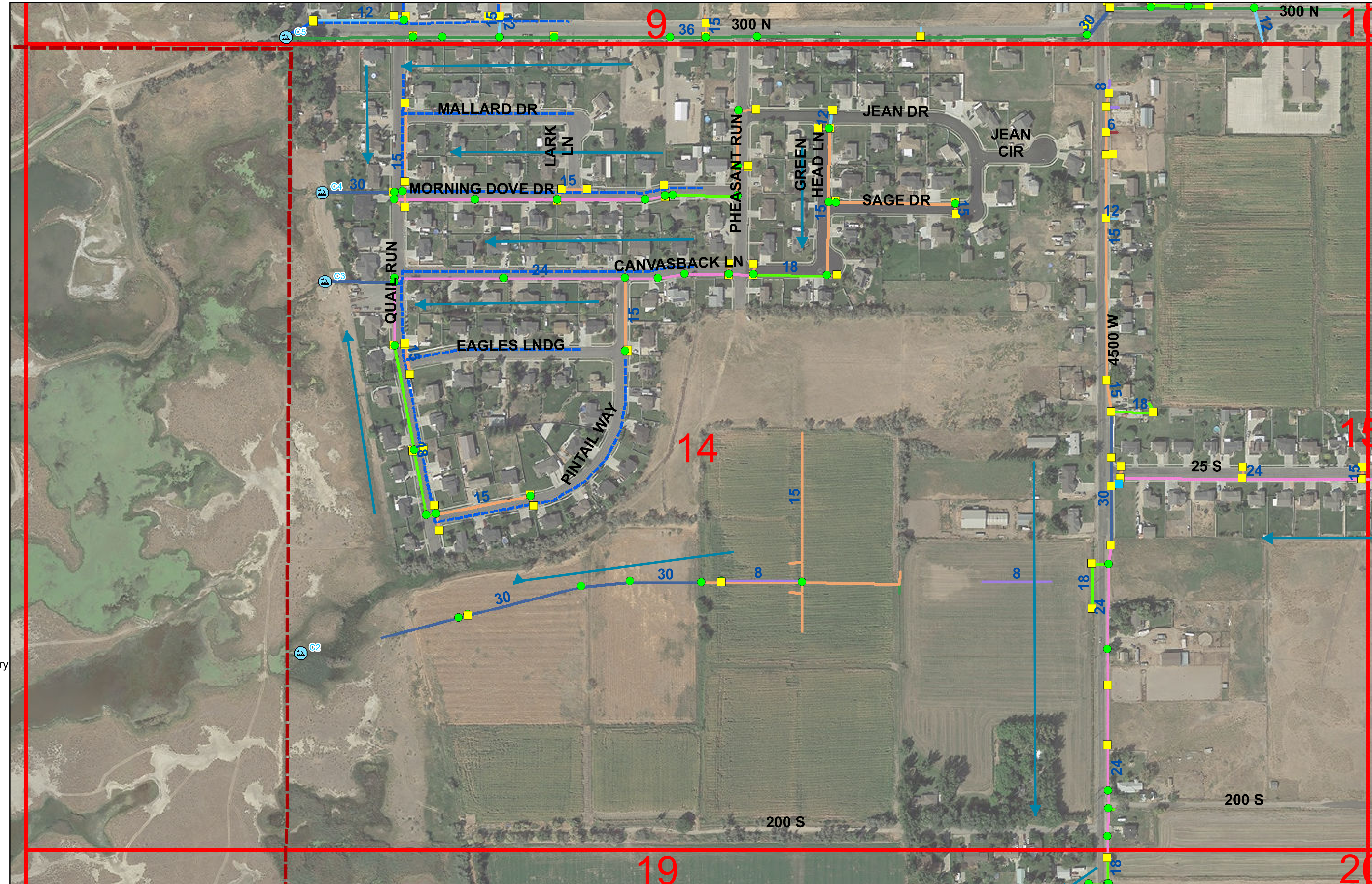

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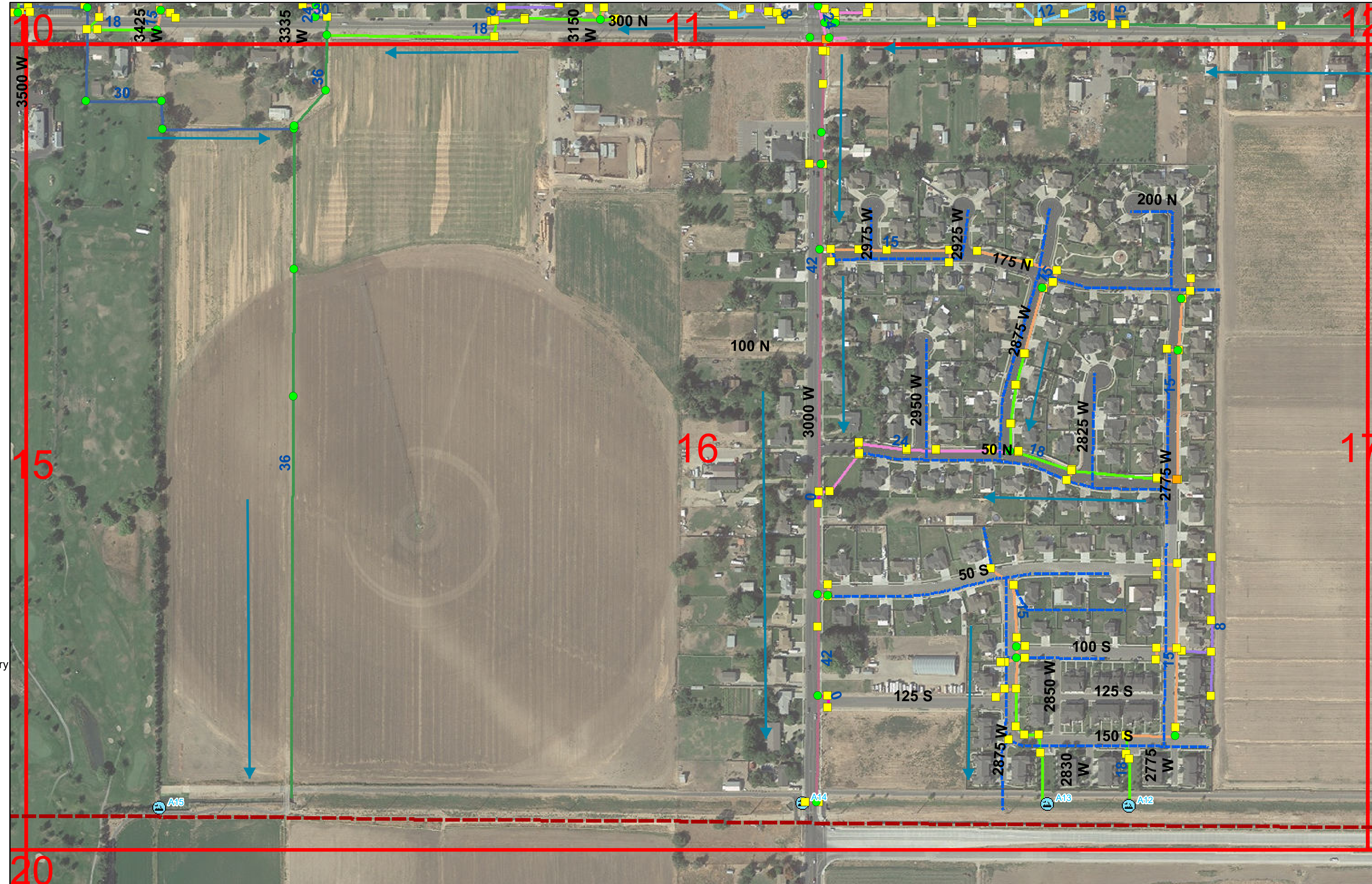
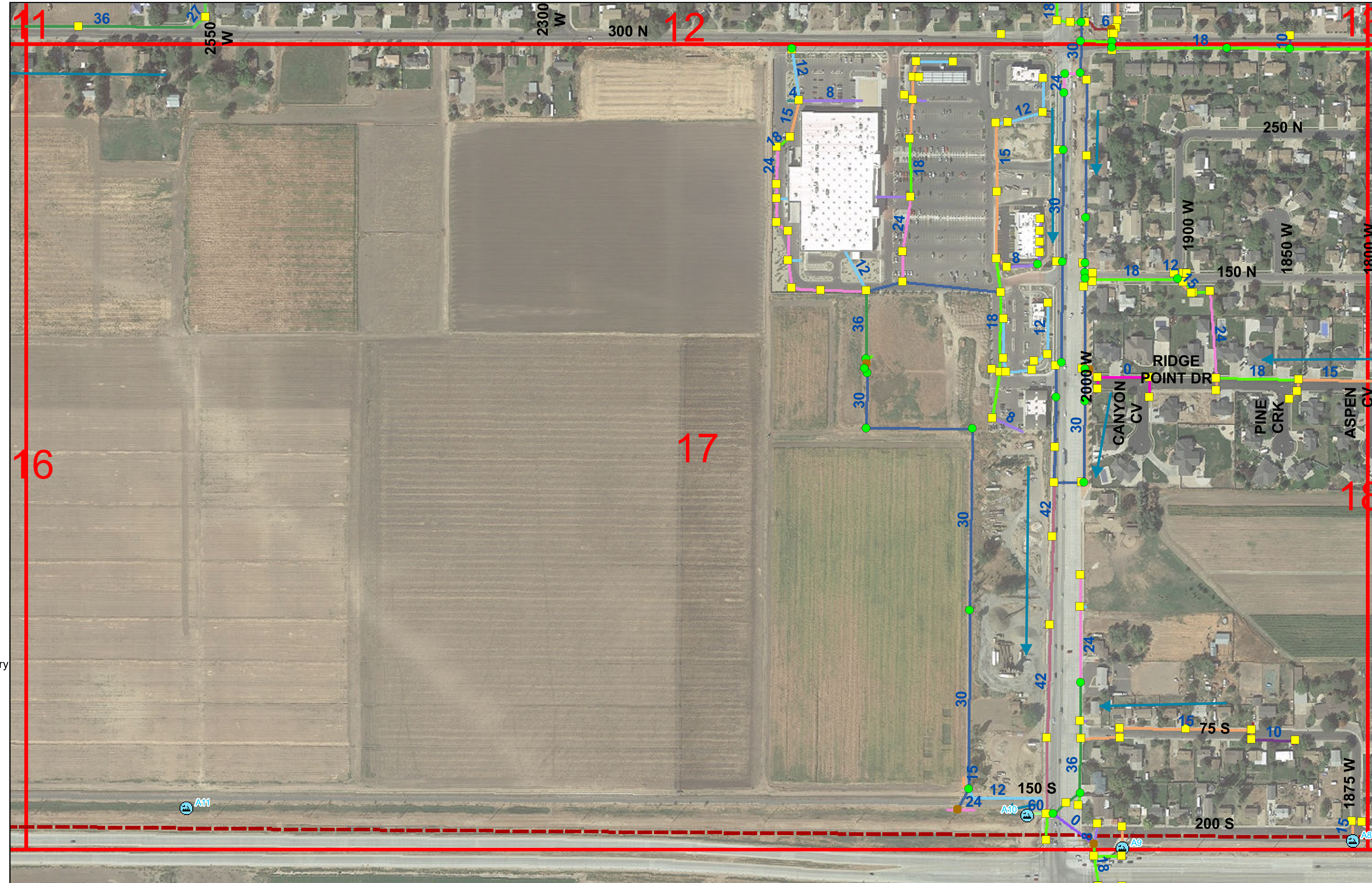


1 inch = 300 feet

Feet 0 150 300 600 900 1,200

West Point Storm Drain 2021



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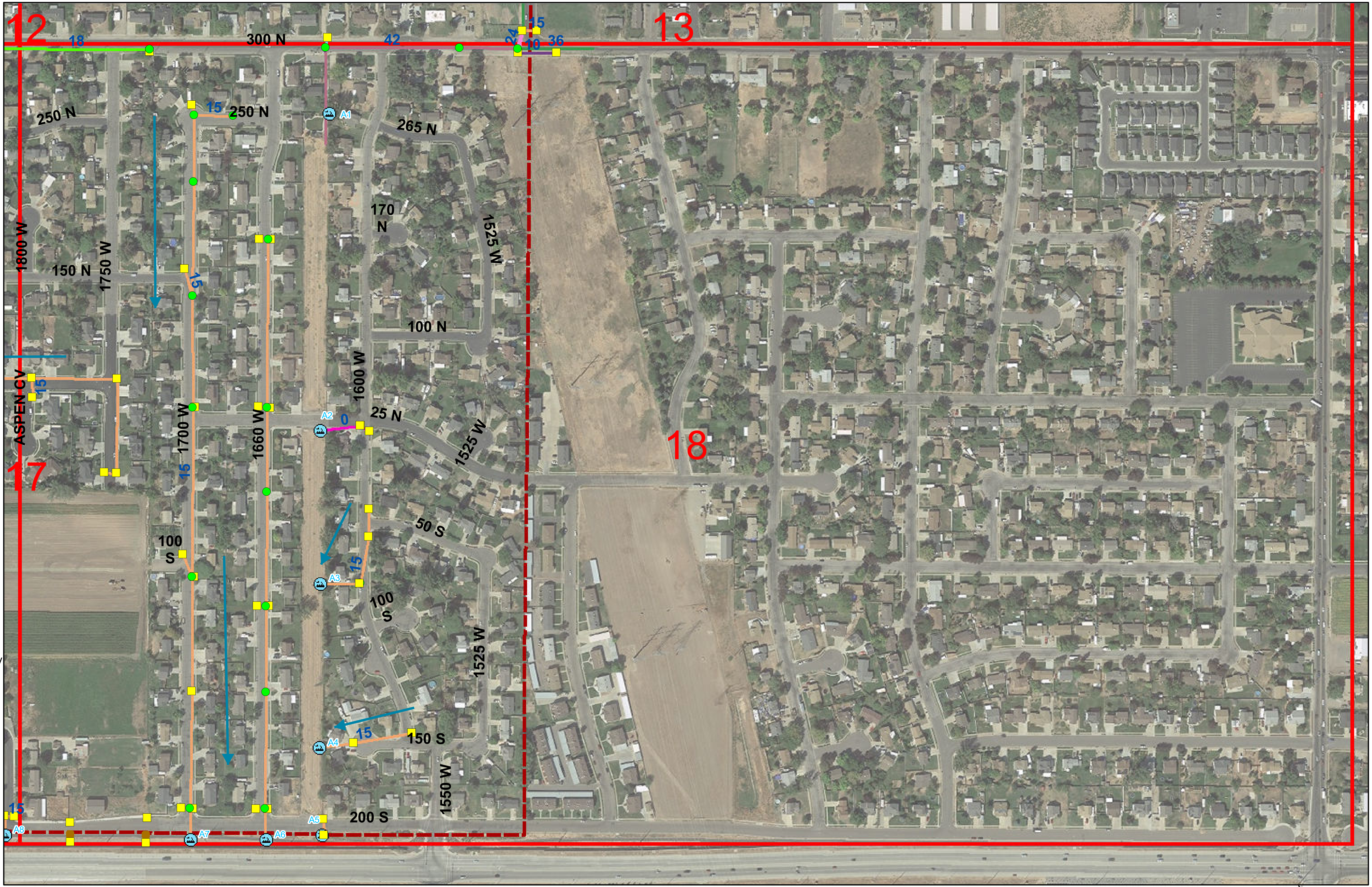

Legend
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SDBOX
Control Structure
DRAIN
OPEN BOX
OVERFLOW BOX
Outfalls
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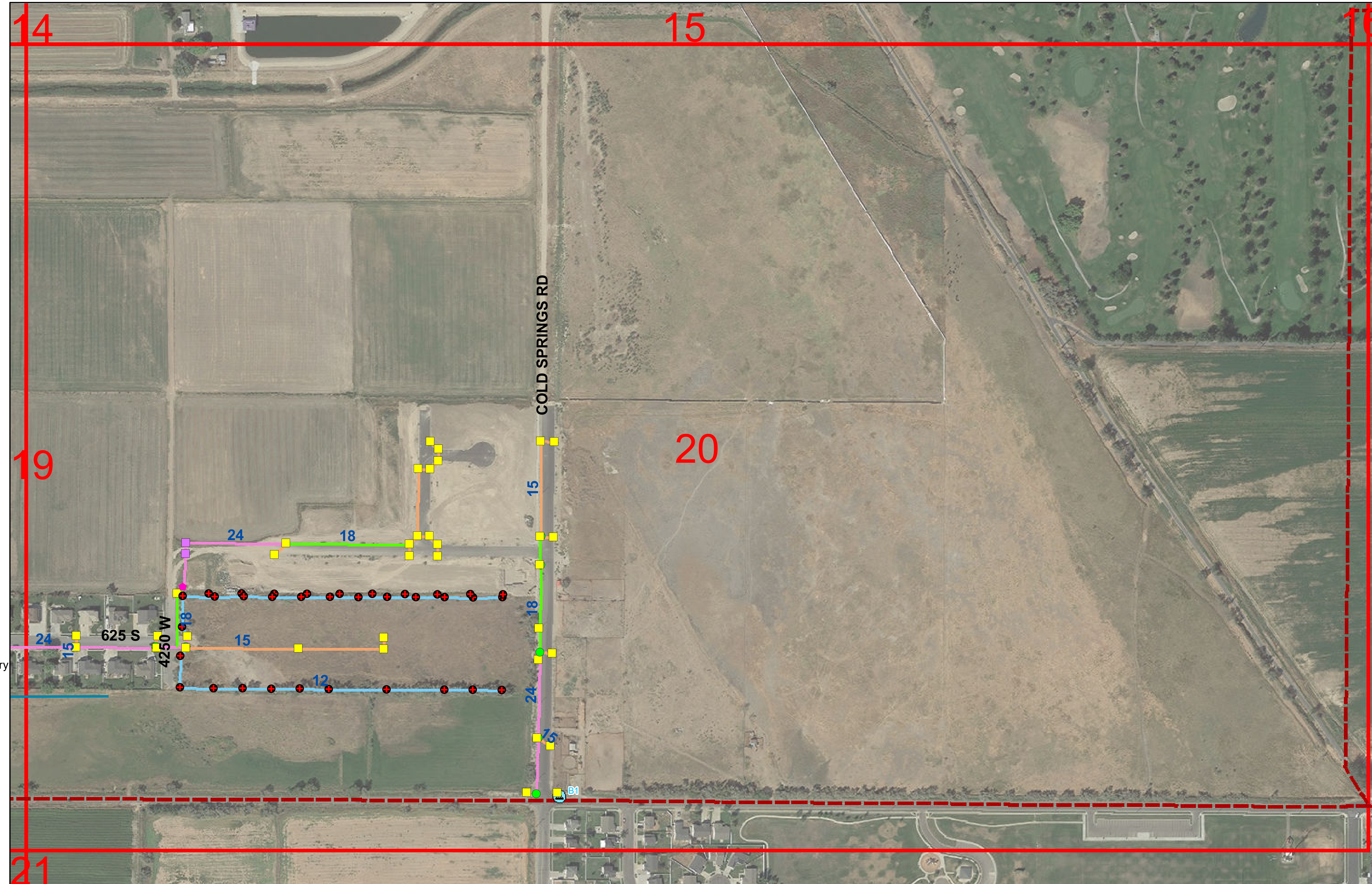

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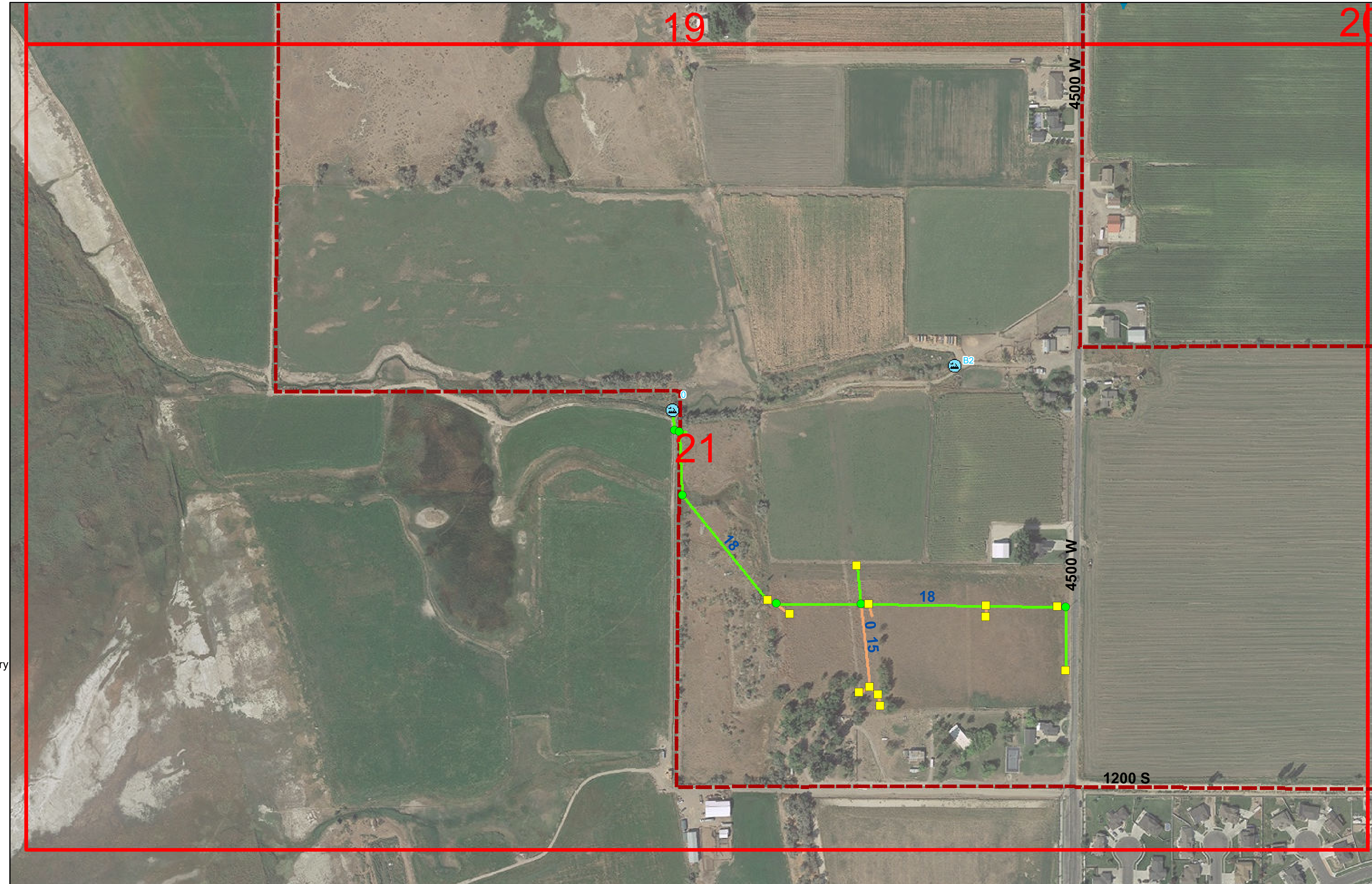

1 inch = 300 feet

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APPENDIX C

Autodesk Storm and Sanitary Modeling Software

Autodesk Storm and Sanitary - Modeling Software

The modeling software used to develop the storm drainage model was Autodesk Storm and Sanitary. The methodology and process behind the model are included below:

A. Elements

The elements used in the model include Subbasin elements, Conveyance Link elements, Junctions elements, Inlet elements, Storage nodes, and Outlets (See Figure 1).

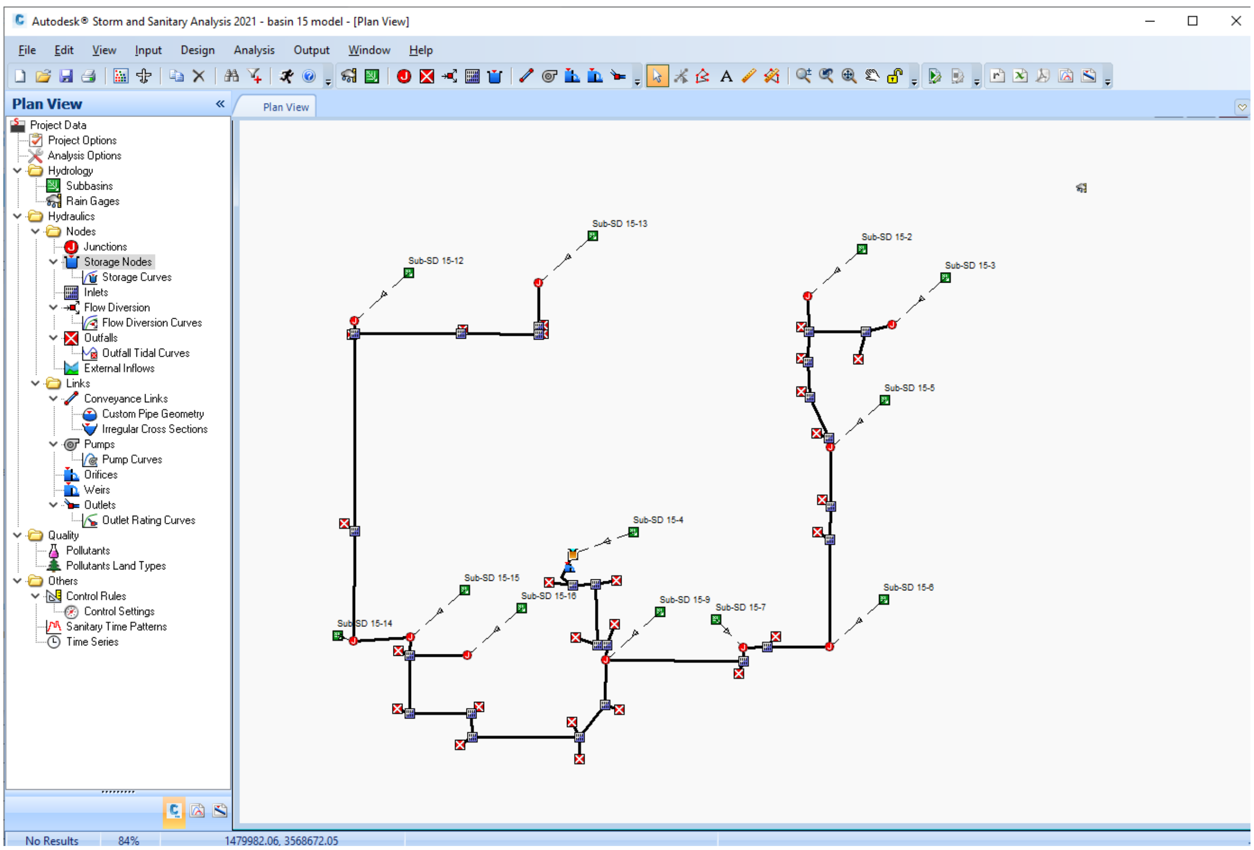
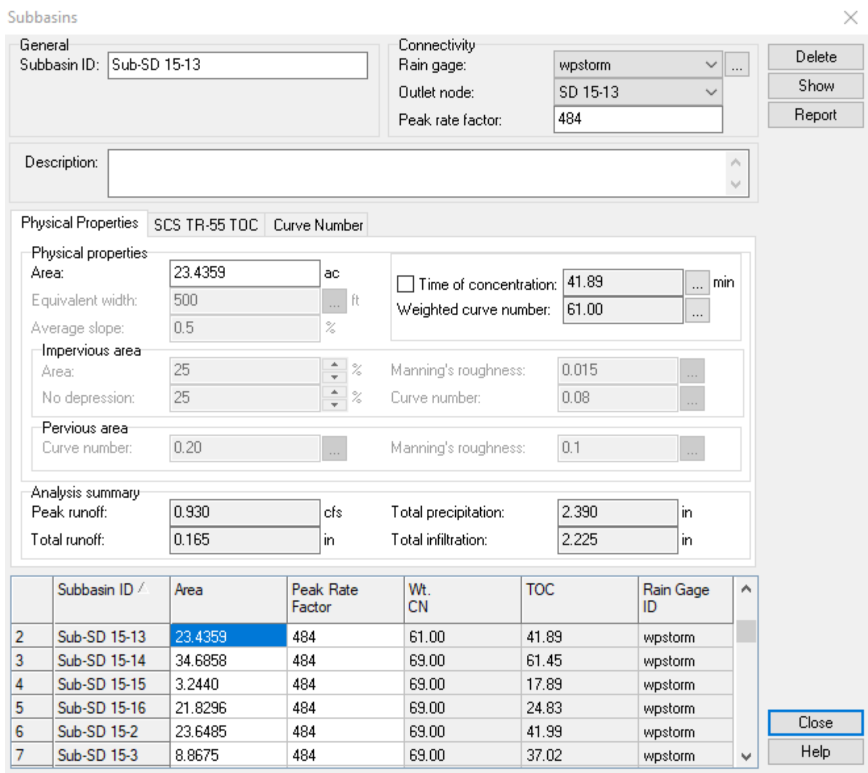


Figure 1

Subbasin Elements: The subbasin elements were used to model areas in the City either fully developed or partially developed**.** There are several parameters that can be modified based on the subbasin characteristics. Subbasins are hydrologic drainage subareas whose topography and drainage system elements direct surface runoff to a single discharge point.

Autodesk® Storm and Sanitary Analysis supports a variety of hydrology methods that allows the user to select the appropriate method to be used for the area being studied. The TR-55 method was selected as an appropriate method for urban watersheds. Figure 2 shows the parameters that can be entered, there are separate tabs for calculating the time of concentration (TOC) and the Curve Number.



<u>Figure 2</u>

The Runoff Coefficient tab defines the drainage area, land use, and soil property data for computing the composite runoff coefficient for the subbasin.
The curve number is based on the land use and the hydrologic soil group. Table 3.6: Runoff Curve Numbers for Urban Areas in the Urban Drainage Design Manual was used to determine curve numbers. Hydrologic soil groups for the entire city were mapped using the USDA NRCS Web Soil Survey and are included at the end of this Appendix C.

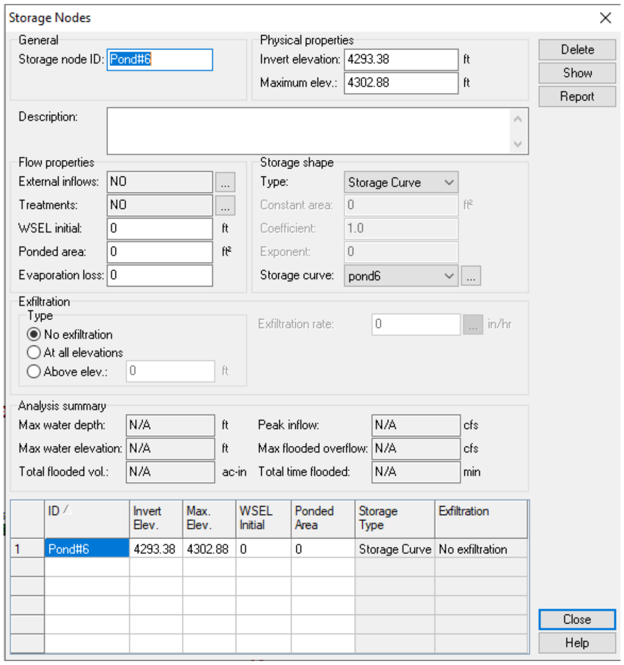
The time of concentration (Tc) is defined as the time required for runoff to travel from the hydraulically most distant point of the subbasin to where the runoff leaves the subbasin. Storm water travels through the subbasin as sheet flow, shallow concentrated flow, open channel flow, or some combination of these.

Conveyance Links: Reach Channels, pipes, and culverts are links that move water from one node to another in the drainage network. The software uses the Manning's equation to compute the flow rate in open channels and partially full closed conduits.

The principal input parameters for channels, pipes, and culverts are:

- Inlet and outlet nodes
- Conduit inlet and outlet node invert elevations (or offsets above the node inverts)
- Conduit length
- Manning's (or equivalent) roughness
- Cross-sectional geometry

Storage Node Elements: Storage nodes are network elements with associated storage volume. Physically they can represent storage facilities as small as a catch basin, more commonly as a detention pond, and as large as a reservoir or lake. The volumetric properties of a storage node are described by a function or table of surface area versus height.



A stage storage curve was determined for each of the ponds and data was inputed along with invert and max water depth.

B. Meteorologic Models

SCS Rainfall Distributions

The highest peak discharges from small watersheds in the United States are usually caused by intense, brief rainfalls that may occur as distinct events or as part of a longer storm. These intense rainstorms do not usually extend over a large area and intensities vary greatly. One common practice in rainfall-runoff analysis is to develop a synthetic rainfall distribution to use in lieu of actual storm events. This distribution includes maximum rainfall intensities for the selected design frequency arranged in a sequence that is critical for producing peak runoff.

The intensity of rainfall varies considerably during a storm as well as with geographic regions. To represent various regions of the United States, National Resource Conservation Service (NRCS, formerly the SCS) developed four synthetic 24-hour rainfall distributions (I, IA, II, and III) from available National Weather Service (NWS) duration-frequency data (Hershfield 1061; Frederick et al., 1977) or local storm data. Type IA is the least intense and type II the most intense short duration rainfall.

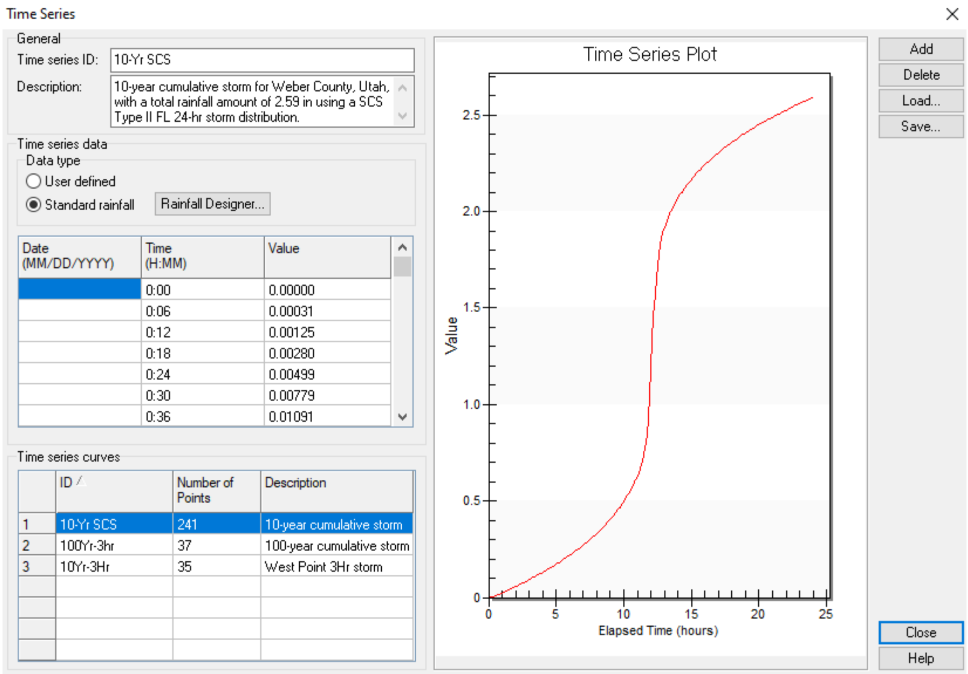


Figure 4

C. Network Analysis

Prior to obtaining model results in is necessary to create a Simulation Run under Compute – Create Simulation Run. The run is specified for a specific basin, meteorologic model and control specifications. Once the simulation run is created the run can be computed by selecting the Run button. The results of the simulation are located under the results tab. Each element in the model has simulation data specific to the element and can be viewed by expanding each element. A Summary Table is also shown for each element. Important data such as peak discharge, peak inflow, peak outflow, and peak storage.

D. Results Analysis

The peak discharge data from the hydrologic simulation was used to analyze future and existing storm drain pipes. The analysis of storm drain pipes was done using the Manning's Equation. Given peak flow rates minimum pipes sizes were determined. The results of the minimum pipe sizes were used to create a list of projects to include in the capital facilities plan.