MURRAY
CITY COUNCIL

Council Meeting
6:30 p.m.

Call to Order

Pledge of Allegiance

Murray City Municipal Council
Chambers
Murray City, Utah

The Murray City Municipal Council met on Tuesday, February 5, 2019 at 6:30 p.m. for a meeting held in the Murray City Center Council Chambers, 5025 South State Street, Murray, Utah.

Council Members in Attendance:

Diane Turner, Chair	District #4
Dave Nicponski, Vice Chair	District #1
Dale Cox	District #2
Jim Brass	District #3
Brett Hales	District #5

Others in Attendance:

Blair Camp	Mayor	Jan Lopez	Council Director
G.L. Critchfield	City Attorney	Jennifer Kennedy	City Recorder
Doug Hill	Chief Administrative Officer	Jennifer Heaps	Comm. & Public Relations Director
Craig Burnett	Police Chief	Robert White	IT Director
Danny Astill	Public Works Director	Jon Harris	Fire Chief
Danyce Steck	Finance Director	Mike Dykman	Administrative Assistant Chief
Blaine Haacke	General Manager of Power	Dave Florin	Fire Captain
Kim Fong	Library Director	Kim Sorensen	Parks and Recreation Director
Brenda Moore	Controller	Melinda Greenwood	Community & Economic Development Director
Phyllis Wall	Treasurer's Department		
		Citizens	

Opening Ceremonies

Call to Order – Ms. Turner called the meeting to order at 6:30 p.m.

Pledge of Allegiance – The Pledge of Allegiance was led by Kim Fong, Library Director.

Approval of Minutes

Council Meeting – January 22, 2019

MOTION: Mr. Brass moved to approve the minutes. The motion was SECONDED by Mr. Cox.

Voice vote taken, all "ayes."

Citizen Comments – Comments are limited to 3 minutes unless otherwise approved by the Council. No citizen comments were given.

Consent Agenda

1. Consider confirmation of the Mayor's appointment of Lesley Burns as a Hearing Officer to fulfill a vacated term, which expires May 6, 2021.

MOTION: Mr. Brass moved to adopt the Consent Agenda. The motion was SECONDED by Mr. Hales.

Council roll call vote:
Mr. Hales Aye
Mr. Nicponski Aye
Mr. Cox Aye
Mr. Brass Aye
Ms. Turner Aye

Motion passed 5-0

Business Items

1. Presentation of Mayor Blair Camp's State of the City Address for 2019.

"Good evening members of the city council, residents, business leaders, department directors, and city staff.

I appreciate the opportunity to present my State of the City Address to you this evening.

I am grateful for the opportunity, and proud to serve as the Mayor and CEO of Murray City. I have an exceptional staff in Doug Hill, Jennifer Heaps, Traci Walker, and Jade Paulson, and I express appreciation to them this evening.

I also wish to personally thank the members of the Murray City Council for their hard work and time invested in performing the legislative functions of Murray City government. Thank you, council members, for your service to Murray City.

I also express my gratitude this evening to the nearly 70 residents who volunteer to serve on one of our 11 boards and commissions, plus many others who volunteer in our parks and recreation programs for seniors and youth. These volunteers serve quietly and without fanfare, yet their impact for good is immeasurable.

I agree with Coretta Scott King who once said: "The greatness of a community is most accurately measured by the compassionate actions of its members." We are indebted to these volunteers who help make Murray City a great place.

I began my last State of the City address by saying "the State of the City is strong and sound, but not without challenges." I will say that is still the case. Throughout my address this evening I will reference some portions of last years' state of the city message and provide some updates.

About two years ago when I publicly declared that I would be a candidate for mayor, I stated in my announcement "I believe in continuous improvement, and I intend to constantly look for, and identify ways that we can be better and more efficient."

In the time since my term began, I have endeavored to live up to that declaration.

I have asked my departments and divisions to continuously look for ways to improve efficiency and effectiveness in the delivery of our city services.

I have taken the opportunity to make some changes this past year that I believe will have a positive impact on our efficiency, and I'll talk about some of those in this address.

I recognize that change is not always comfortable for people, but I maintain that any organization must consider changes and make periodic adjustments to remain healthy.

Abraham Maslow once said, "In any given moment we have two options: to step forward into growth or step back into safety." As a city, let us step forward into growth.

Murray City has outstanding department and division directors who are knowledgeable, professional, and dedicated. We will provide a copy of the 2018 year-end summary report to the city council and to the public and encourage you to review the many accomplishments of each department.

I would like to give emphasis to a few of these noteworthy facts this evening.

Our city attorney's office is tasked with ensuring that legal processes are followed in order to minimize the exposure of the city to liability and litigation. This includes areas of land use, planning, public safety matters, complex power department issues, criminal prosecution, civil litigation, records management, human resource matters, general risk, and others.

The Murray legal team is directed by our city attorney, G.L. Critchfield, who points out that their work cannot be measured by numbers, but rather their accomplishments are reflected not only in the numerous ordinances, resolutions, agreements and other such documents that they draft and review, but also in the advice and counsel they provide to the city.

This evening I want once again to acknowledge and thank our excellent Finance and Administration Department under the direction of Danyce Steck. Danyce, a Certified Public Finance Officer, is a seasoned veteran in the arena of public accounting and best practices, and we are very fortunate to have her leading this department.

Once again, this year, the finance department has prepared and provided an excellent Comprehensive Annual Financial Report (CAFR) which was presented to the city council. It is also available for public review on the City website.

Our finance department received a clean independent audit report and received the Certificate of Excellence in Financial Reporting from the Government Finance Officers Association.

Also noteworthy is the new "Citizen's Guide to the Budget" developed by the finance department to educate our residents about the services the city provides, the cost of those services, and the sources of city revenues. This guide is available on the Murray City Website.

The finance department also played a major role in developing and implementing the city-wide comprehensive compensation study focused on employee retention. I will mention more about that later in this address.

I have recently implemented organizational changes that have increased the responsibility of the Finance and Administration Department, including utility billing, the City Recorder division (including purchasing) the City Treasurer, and Human Resources Division. I believe these changes will add to the efficiency and effectiveness of each of these divisions, contribute to continuous improvement and include a financial savings.

Our Police Department, under the leadership of Chief Craig Burnett, has continued to experience an increase in call volume relating to the transient and unsheltered population. There have been efforts to focus police presence in areas that are frequented by these individuals and directed patrol shifts have been used this year.

These are extra shifts wherein officers dedicate their efforts exclusively to the homeless problem in Murray by identifying people, coordinating to clean-up campsites and serving warrants on wanted individuals. These clean-up details have been done in conjunction with our Police Community Services Division and the County Health Department.

As your mayor, I once again call upon all residents of Murray to do your part in discouraging crime in our neighborhoods by installing security lighting or leaving porch lights on, watching out for your neighbors, and reporting suspicious activity to the police department. I believe we can cut down on the crimes if we will be diligent in helping the police.

I also wish to acknowledge and thank our police officers for their appropriate and timely response to the recent gang related shooting at Fashion Place Mall. This is an example of how our officers without hesitation put themselves in harm's way for us.

I cannot overstate my gratitude that the Fashion Place incident resulted in no loss of life, no serious injuries, and minimal property damage. It could have been so much worse.

I would also like to recognize the Murray Crime Advocate Program which has been in existence since 1996. Our two full-time victim advocates, Alissa Black and Julie Johansen do amazing work, mostly behind the scenes. In 2018 these women were able to provide personal advocacy services to over 1,900 victims of crime.

Sadly, domestic violence contributed to approximately 55% of the caseload for the advocates. In addition to domestic violence, these advocates also assisted victims of sexual assault, elder abuse, child abuse, homicide, robbery, kidnapping, assault, stalking, DUI, traumatic deaths,

threats, harassment, and suicide. Without the victim advocate program, most of the victims of crime in Murray would not receive assistance or resources. Thank you, Alissa and Julie, for the exceptional service you provide.

This past June our long-time fire chief Gil Rodriguez retired, and I took the opportunity to appoint Deputy Chief Jon Harris as the new fire chief. I've literally known Chief Harris for his entire career, as I was the Assistant Chief in the fire department when Jon was hired in 1995. Chief Harris is a forward thinker and I expect that he will be innovative in his approach to leadership in the fire department.

In 2018, the fire department responded to over 6000 emergency calls from our city's three fire stations. Nearly 5000 of those were requests for emergency medical services. We offer state-of-the-art fire, paramedic, and rescue services to our residents, businesses, and visitors.

Also, in 2018 our fire department was utilized in four wildfire deployments, two in California and two separate deployments to the Pole Creek fire in central Utah. One of our teams working the Mendocino Complex fire was working on the task force with Draper City Battalion Chief Matt Burchett, who was killed in a fire-line accident. We continue to mourn with the Draper fire department, but we are so grateful that our crews came home safely from each of these deployments.

Our Parks & Recreation Department is directed by Kim Sorensen. The Murray City parks system continues to be a great asset and very popular in our community. The Park Center sold over 6,000 memberships and the daily admissions total for the Park Center in 2018 was 42,306.

The pool decks were replaced in both the leisure pool and the competition pool this past year. The daily admission totals to the outdoor pool was 37,270. There were 11,712 participants in recreation programs. The new pickleball courts were finally completed and are very popular and well utilized.

Cultural Arts hosted a total of nearly 30,000 patrons and provided opportunities for 1180 artists from both performing and visual arts, including the recent Murray Mural Project which included 2,918 children between the ages of 6 to 18.

The Fun Days parade and activities were very popular again last year, as thousands lined the street to see the parade. The new "chalk art" contest was well received.

An on-going matter of concern is our park infrastructure. The Capital Improvement Plan funds for the parks will provide long over-due repairs and renovations, such as pavilion replacement.

I appreciate the Council approving the funding for the Parks and Recreation Master Plan. That Master plan process is now underway and will continue throughout this year. We are looking forward to future dialog based on the completed plan later this year.

During this past year the Murray Heritage Center took on a new identity and is now known as the Murray Senior Recreation Center. Once again, the center served nearly 11,000 meals in 2018.

At the end of 2018, the Center had 1518 registered participants. We had 114 volunteers who assisted in providing programs and services. These volunteers donated approximately 7,300 hours of service. That equates to a value of approximately $73,000.

Our Murray Library, under the direction of Kim Fong, continues to maintain its vision of being "your friendly hometown library." In 2018, the library was awarded two accolades, the first being a Quality Library certification from the Utah State Library. The other was a Four-Star Library designation from Library Journal, which compared the Murray Library with other libraries nationally.

We appreciate the support of the city council in approving the mil levy increase for the library in this current budget year, which will go a long way in helping us plan and prepare for a new library in the future.

The Murray City Power Department, under the direction of General Manager Blaine Haacke, continues to operate effectively and competently. The power fund is in a favorable financial condition and there is currently no outstanding bond debt.

Our Power Department is excited to continue to pursue and invest in power projects that add to the reliability of our system. We continue to have interest in the SMR (Small Modular Reactor) project and are exploring options for participation in a large-scale solar project. We are committed to increasing the amount of "green" energy in our portfolio.

From the perspective of the General Manager, the top five significant successes of the Power Department for last year would be:

1- *The financial stability and health of the department.*
2- *Improved reliability of delivered energy. This includes a concerted, controlled effort to maintain tree clearances from the distribution lines and service street trees. Our power is on 99.9886% of the time, and that is important for our residents and businesses.*
3- *Keeping the costs of operation, maintenance, and capital expenses down while maintaining a lean workforce.*
4- *Keeping on top of the NERC (North American Electric Reliability Corporation) reliability requirements.*
5- *Working toward a solar roof top rate while collaborating with customers and vendors.*

I want to reemphasize what I have stated before, it's important to note that all residents of Murray benefit from the city-owned utility, even those who are not receiving electricity from Murray Power.

The Power Department pays an annual dividend to the city General Fund, provides trimming of street trees, and subsidizes street lighting in the entire city, which benefits all residents.

The Murray City Director of Public Works is Danny Astill. Public Works includes Engineering, Fleet, Streets and Solid Waste, Storm Water, Sewer, and Water Distribution.

We are pleased to report that Engineering was successful in receiving two Transportation Choice grants, including an additional $500,000 for the Hanauer Street extension project, and an additional $731,000 for the east Vine Street project.

The Streets Division used 4,673 tons of asphalt in 11 overlay projects, completed five residential street rebuilds, and mastic or slurry sealed 45 city streets. Street maintenance continues to be a challenge due to funding constraints, but our streets personnel have found ways to stretch the available dollars to deliver the most "bang for the buck." Our crews filled 641 potholes this year.

The Drinking Water Source Protection Plan update was completed this year. Clean water is a high priority for our Water Department, and they work hard to meet or exceed all state and federal regulations pertaining to quality drinking water. They sampled all active sources in April and October in accordance with the EPA's Unregulated Contaminant Monitoring Rule. In addition, they sampled 45 bacterial sites every month with no positive samples or rechecks.

The recent snow storms serve as a reminder of the exceptional service provided by our crews in removing snow from our public streets. I appreciate their efforts in making our streets safer.

Our Department of Information Technology (I.T.) is led by Robert White. Although Rob was appointed as the Director of I.T. a few months ago, he is a seasoned veteran of Murray City for more than 21 years.

As a result of an organizational change, our I.T. department now includes the Geographic Information Systems Division (G.I.S.). G.I.S. is an invaluable resource used for mapping throughout the city for uses such as public safety, power lines, public utilities such as water and sewer lines, streets, and many other uses on a daily basis.

The I.T. Department provides technical support for every department in Murray City, plus the City Council. Our entire city literally depends on I.T. support to keep city operations functioning. Throughout the last year, they have continued to work on the conversion for the Munis software system for business licensing, permits, and planning and zoning. The Utility Billing system is the last module to be implemented and this will take place over the next several months.

New to the Murray City team is our recently hired Director of Community and Economic Development, Melinda Greenwood. Melinda oversees the Planning and Building Divisions, including business licensing, code enforcement, and Redevelopment Agency issues. The CED Department is extremely active and hardworking, with new developments both residential and commercial throughout the city.

There was a slight increase in the number of licensed business in Murray in 2018, with a total of 3,976, up 25 over the previous year.

Our City Justice Court is presided over by Judge Paul Thompson. It continues to operate well, although not without its challenges. The caseload of the court has been declining over the past several years, but appears to have leveled off, with a slight increase in traffic and misdemeanor cases in 2018.

The court has taken several measures to reduce costs. In addition to a paperless system, the court has also rearranged court times and appearance requirements to increase efficiency. In addition, they are working with the Adult Detention Center to conduct video processes where feasible to reduce the number of transports of inmates.

Last month our Court Administrator, Mike Williams retired after 40 years of courts experience. Mike will be missed. With his departure, we are taking advantage of the opportunity to implement some organizational changes in the court structure that will result in some savings to the City.

Last year in the State of the City address I mentioned that the employee compensation study approved by the city council was underway. That study was comprehensive and took hundreds of hours to complete and implement.

I'm pleased to note this evening that the study and its implementation were completed just prior to the start of the current budget year and addressed the compensation concerns of our police officers, firefighters, and employees in every department of Murray City, and included a new step plan for employees.

I wish to express great appreciation to department directors, finance personnel, human resources personnel, and all others who worked so hard to make this a reality, but especially I extend gratitude to the city council for having the courage and political will to fund this new step plan, even though it required a moderate tax increase to do so.

We have seen an increase in morale across all departments. I frequently receive comments of appreciation from employees, and I pass those expressions of gratitude on to the city council.

I'm happy to note that our new headquarters fire station is now under construction at the corner of 4800 South and Box Elder Street. This building will house fire administration, fire prevention, and emergency response personnel. It is anticipated that this building will be completed in November.

With the relocation of the fire department, we will be able to extend Hanauer Street in preparation for the construction of a new city hall on which we anticipate construction to begin in 2020. An architect and general contractor have been selected for the city hall project and we will soon have conceptual drawings to take to the public.

I am very excited to have construction activity taking place in this underutilized section of our city. I vow to advocate for new projects for this area, particularly private sector development.

The renovation of the city-owned Murray Theater is front and center due to the awarding of $3.6 million over the next two years in TRCC (Tourism, Recreation, Cultural, and Convention) funds from Salt Lake County. Because this is a matching grant, some challenging decisions will need to be made regarding the source of the matching funds. We do feel fortunate to have been awarded these funds in a very competitive and crowded field of applicants.

I'd like to take a minute and follow up on a few matters from last year's state of the city address. I mentioned my intent to increase our transparency by live streaming our Planning Commission meetings. We have done that. We began recording and streaming these meetings starting with the July 5, 2018 meeting. In addition to the live stream, these meetings are available to view from the video archive on the city website.

I also mentioned my support of a more walkable and rideable community. We have added bicycle lanes to 700 West from 5400 South to Winchester Street, and we continue the task of adding sidewalks and bike lanes on east Vine Street over the next two years.

I am extremely pleased to note the completion of the Canal Trail improvements from Fontaine Bleu to Wheeler Farm. This has become a very popular recreation resource for the residents of the area, and I appreciate the great job that our parks and public works employees have done in overseeing construction, and now maintenance of this fabulous resource.

Last year I announced my intent to bring the Green Bike program to Murray City, particularly around transit stops, Fashion Place Mall, and Intermountain Medical Center. We have been working with Green Bike on costs and feasibility and have developed a concept plan. A small but interesting development has been the introduction of other modes of alternate transportation, such as electric scooters and electric bicycles. At present we have not come to a conclusion on the best direction to proceed, but we will continue to evaluate options and explore possible funding.

Also last year I mentioned my intent to roll out a Murray City Adopt-A-Street program to enable organizations, businesses, and individuals to volunteer to help maintain and beautify the streets of Murray. It has taken many months to work through legal and logistical issues relating to this program, but I am happy to note that the policies and procedures have now been ironed out and the program is ready to go this spring.

It will be implemented through the Public Works department, and details can be found on our city website under "Adopt a Roadway." As I mentioned before, I want Murray to be a place we can all be proud to call home!

Before concluding this evening, I want to take a moment to mention a tragedy that occurred here in our community on November 19, 2018. Just before 7:30 in the morning, our firefighters and police officers responded to a house fire at 5729 South 700 West.

First police officers who were nearby, and then firefighters arrived to find the home fully engulfed in flames. Entrance into the home was literally impossible. A 7-year old girl, a student at Viewmont Elementary, and her grandmother were unable to escape and tragically died in the fire. The subsequent investigation determined the fire an accidental tragedy relating to "electrical overload and resistance heating."

A heartbreaking event like this has a distressing and saddening effect on all of us, including (if not especially) our first responders. For me it brings into focus and perspective the things that really are important. I hope we can use this and other events to help us direct our efforts on the things that matter most to us, our families, our neighbors, and our community.

Maybe it's the old fire chief in me, but I encourage each one of you to take the time to evaluate the safety of your own homes, and plan and prepare for, but mostly prevent these types of tragedies.

This evening I wish to reaffirm that the State of Murray City is strong and sound. However, I note that the State Legislature is in session even as I speak, and there are some on the hill who are proponents of legislation that could be extremely detrimental to the financial stability of Murray City.

We are working diligently to identify and oppose those bills that would harm our city. I strongly encourage each of you to find out who represents your district in the legislature and ask them where they stand on any legislation that threatens the local authority of cities.

In conclusion I want to highlight five areas of priority for the coming year:

1. *Eliminate or greatly reduce empty commercial buildings in Murray City through proactive engagement with property owners through our Community and Economic Development Department.*
2. *Proactively advocate for new development in the Murray City Center District to reverse the disinvestment in that area over the past many years, working closely with the Redevelopment Agency Board of Directors.*
3. *Work closely with the Parks and Recreation Department, specifically the Cultural Arts Division, the Finance and Administration Department, and the city council to address funding for the Murray Theater renovation.*
4. *Continue to improve in the areas of social media use and technology.*
5. *I remain fully committed to the concept of continuous improvement and will continue to challenge my department directors to seek for additional improvement wherever possible.*

I recognize that the funds we expend are taxpayer dollars. At our public meetings during the budget process last year, I was approached by some residents who said they recognized the need to fairly compensate our employees and that it costs a lot to provide city services but implored us to cut cost and be more efficient wherever possible. That's a very reasonable request.

The American author and motivational speaker Tony Robbins said: "I don't worry about maintaining the quality of my life, because every day I work on improving it."

Tonight, I borrow that quote from Mr. Robbins and tweak it just a little by saying: "I won't worry about maintaining the quality of Murray City, because every day I work on improving it."

Remember our two options: to step forward into growth or step back into safety." We will step forward into growth.

Thank you."

Mayor's Report and Questions

Mayor Camp reported on the following items:

- the Canal Trail is currently closed at 6400 South due to a bridge replacement and will reopen the last week of February.

- the Library's Harry Potter Extravaganza was an enormous success with an estimated 300 people attending.

- Fix A Leak Week will be held March 18 – 24, 2019. This is an opportunity for the Water Department to educate the public and elementary school students about water conservation.

Adjournment
The meeting was adjourned at 7:10 p.m.

_____
Jennifer Kennedy, City Recorder

MURRAY
CITY COUNCIL

Special Recognition #1

MURRAY

Parks & Recreation

Employee of the Month, Jesse Chappell

Golf Course, Equipment Operator II

Council Action Request

Council Meeting
February 19, 2019

Department Director Kim Sorensen Phone # 801-264-2619	**Purpose of Proposal** • City Council Employee of the Month Award **Action Requested** • Informational only. **Attachments** • Employee of the Month Recognition Form
Presenter Kim Sorensen and Brett Hales	**Budget Impact** • None
Required Time for Presentation	**Description of this item** (This should provide council members a clear understanding of the matter.) Jesse has worked for Murray City for 15 years, is a valued employee with extraordinary talents, abilities and knowledge of golf course maintenance. He tackles difficult projects and repairs, often saving the city money.
Is This Time Sensitive No	
Approval: **N/A** February 8, 2019	

EMPLOYEE OF THE MONTH RECOGNITION

DEPARTMENT: DATE:

Parks and Recreation

NAME of person to be recognized: Submitted by:

Jesse Chappell Kim Sorensen

DIVISION AND JOB TITLE:

Golf Course, Equipment Operator II

YEARS OF SERVICE:

15

REASON FOR RECOGNITION:

Jesse is a valued employee to Murray City and the Parkway Golf Course. He is an important part of the golf course staff and performs at a high level for the benefit of Murray City.

Jesse's talents, abilities and knowledge of golf course maintenance is extraordinary. He performs his required job duties skillfully and efficiently. Jesse often tackles difficult projects and repairs saving the City money.

Jesse is a team player who gets along well with peer employees, the public and customers. He is always willing to lend a hand to help others complete their projects. Murray City is fortunate to have Jesse Chappell as an employee at the golf course.

COUNCIL USE:

MONTH/YEAR HONORED February 2019

MURRAY
CITY COUNCIL

Citizen Comments

Limited to three minutes, unless otherwise approved by Council

MURRAY
CITY COUNCIL

Public Hearing #1

Power Department

Navajo Tribal Utility Project

MURRAY

Council Action Request

Council Meeting

Meeting Date: February 19, 2019

Department Director
Blaine Haacke

Phone #
801-264-2715

Presenters
Blaine Haacke
Bruce Turner

Required Time for Presentation
15 Minutes

Is This Time Sensitive
No

Mayor's Approval

Date
February 5, 2019

Purpose of Proposal

Send four power department employees to the four-corners region to help set up power for the Navajo Nation

Action Requested

Consideration of a resolution

Attachments

Map of the different districts, tentative project list, resolution

Budget Impact

See approximate costs below

Description of this Item

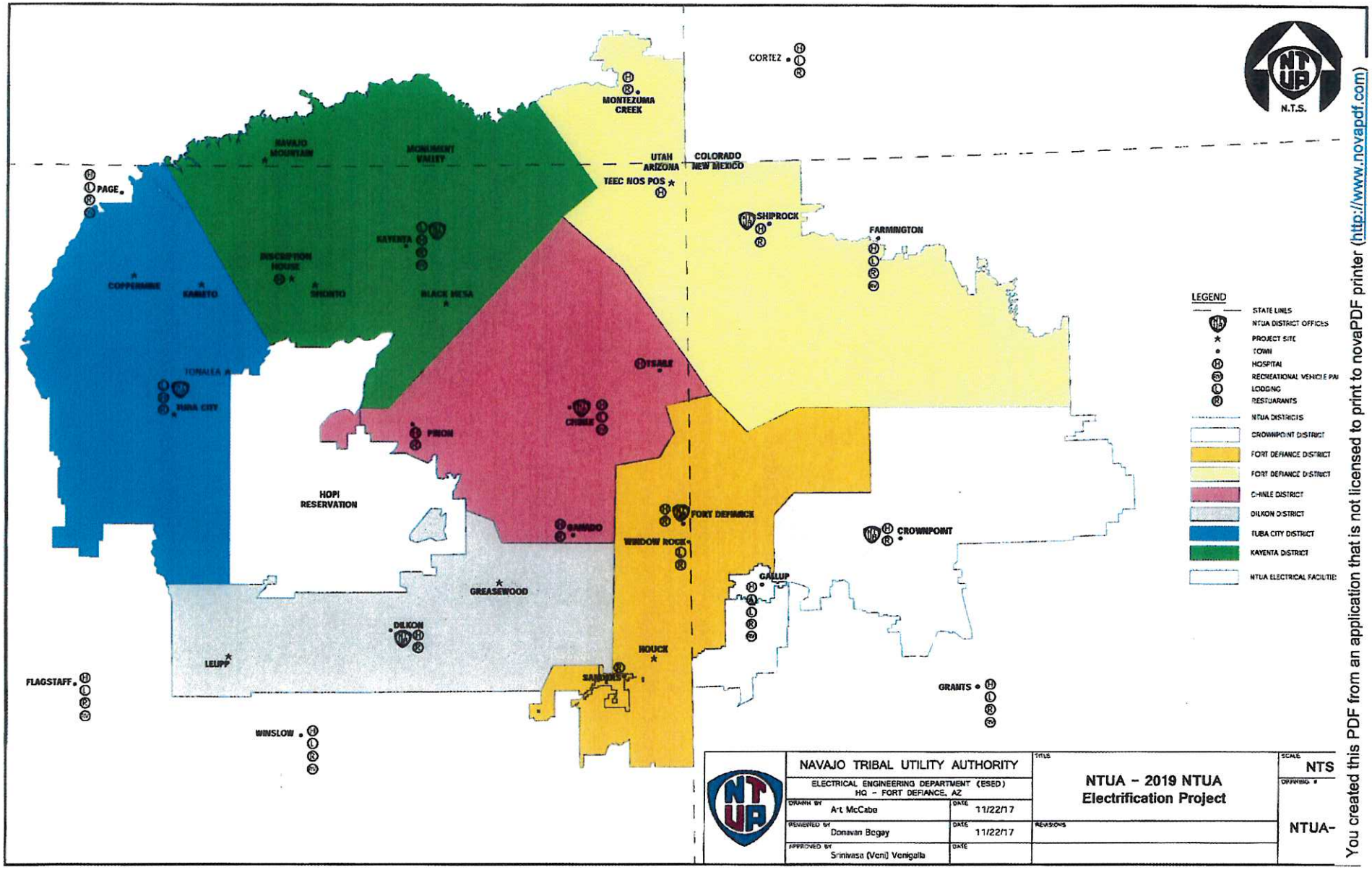
We would like to send 1 Lineman Supervisor, 2 Journey Lineworkers and 1 Apprentice Lineman to help bring power to the Navajo Nation in and around the the four-corners region. They would leave on May 11 and work for 7 days. They would take a Murray City Power line truck and bucket truck. Hotel will be paid by APPA. The following is an estimated cost to us:

Four man crew 40 Hours	$11,200.00
Four man crew 20 hours overtime	$ 8,400.00
Line Truck 60 hours:	$ 2,760.00
Bucket Truck 60 Hours:	$ 2,280.00
Four man crew per diem:	$ 1,430.00
Total:	$26,070.00

NTUA 2019 Electrification - Tentative Project List

	Project ID No.	Agency	Chapter	Project Description
	ROW ONLY - Construction NOT Funded			
1	161500040	Western	**Shonto**	South - Phase II Extension
2	161700006	Western	**Navajo Mountain**	Rainbow Plateau
3	111530076	Fort Defiance	**Houck**	Scattered
4	14170017	Western	**Kaibeto**	Scattered (No. 2)
5	161630008	Western	**Inscription House (Ts'ah Bii Kin)**	Scattered
6	181300011	Fort Defiance	**Greasewood Springs**	Scattered Extensions
7	141430002	Western	**Coppermine**	Scattered - Phase IV
8		Western	**Tuba City (To'Nanees'dizi)**	Shadow Mountain - Phase IIB Extension
9		Western	**Tuba City (To'Nanees'dizi)**	Shadow Mountain - Phase IIB Extension
10	131600018	Chinle	**Black Mesa**	North Valley Extension
11	141600016	Western	**Tonalea**	Wildcat Peak - Phase II
12	181600030	Western	**Leupp**	North Grand Falls
13	121600038	Northern	**Teec Nos Pos**	Garcia Camp
14	121630063	Northern	**Teec Nos Pos**	Scattered
15	161700010	Western	**Inscription House (Ts'ah Bii Kin)**	Electrification Initiative

Our standard crew size for cold line construction consist of one (1) Foreman, one (1) Journeyman Lineman and two (2) Helpers/Apprentices. Typical equipment available for use during construction includes 60-ft bucket truck, backhoe (if needed), two utility trucks, digger derrick, pole trailer and pressure digger. The terrain can be rugged, thus units equipped with 4-wheel drive is preferred.



Murray City Corporation

NOTICE OF PUBLIC HEARING

NOTICE IS HEREBY GIVEN that on the 19th day of February, 2019, at the hour of 6:30 p.m. of said day in the Council Chambers of Murray City Center, 5025 South State Street, Murray, Utah, the Murray City Municipal Council will hold and conduct a hearing to receive public comment concerning a proposed resolution which would authorize the City's Power Department to provide volunteers and the donation of services and nonmonetary assistance to the Navajo Tribal Utility Authority to aid in a project to construct electrical infrastructure for the 15,000 Navajo Nation homes which do not have electricity.

DATED this _____ day of February, 2019.

MURRAY CITY CORPORATION

_____
Jennifer Kennedy
City Recorder

DATES OF PUBLICATION: February 4, 2019

RESOLUTION NO. _____

A RESOLUTION APPROVING THE DONATION OF IN-KIND SERVICES TO THE NAVAJO TRIBAL UTILITY AUTHORITY'S "LIGHT UP NAVAJO" INITIATIVE PROJECT

WHEREAS, in accordance with section 10-8-2 of the Utah Code the City Council may authorize municipal services and/or nonmonetary assistance to be provided to nonprofit entities regardless of whether the City receives consideration in return; and

WHEREAS, the Navajo Nation is the largest Native American territory in the United States. Among the 55,000 homes located on the 27,000 square mile reservation, about 15,000 do not have electricity; and

WHEREAS, the Navajo Tribal Utility Authority (NTUA), a nonprofit entity created by the Navajo Nation, has launched the "Light Up Navajo" initiative (the "Initiative"), in which it is seeking volunteer crews and in-kind donations of expert labor and the use of power truck equipment in order to help expedite electrification projects within the Navajo Nation; and

WHEREAS, under the Initiative, volunteer crews would be working with NTUA crews to help build electric lines to serve homes for the first time; and

WHEREAS, the American Public Power Association (APPA) has asked member utilities to assist with the Initiative and is helping to approve volunteer registrations; and

WHEREAS, as a member of the APPA, the City wants to be responsive and assist the NTUA with the Initiative by (1) providing a crew, (2) paying the crew a per diem, and (3) covering the cost of transporting the power trucks to and from the Navajo Nation; and

WHEREAS, the NTUA will provide all materials for the electrification projects, as well as food and lodging for City crews; and

WHEREAS, City crews would volunteer in the Navajo Nation from May 11, 2019 through May 18, 2019; and

WHEREAS, pursuant to section 10-8-2 of the Utah Code, the City Council held a public hearing on February 19, 2019 to receive and consider public comment on the City's proposed donations to assist with the Initiative;

NOW, THEREFORE, BE IT RESOLVED by the Murray City Municipal Council as follows:

1. It hereby approves and authorizes the donation of in-kind services to the NTUA in support of the Light Up Navajo initiative; and

2. It authorizes the Mayor to execute any documents required to implement the City's participation in the Initiative.

DATED this 19th day of February, 2019.

MURRAY CITY MUNICIPAL COUNCIL

_____

Dave Nicponski, Chair

ATTEST

_____

Jennifer Kennedy, City Recorder

MURRAY
CITY COUNCIL

New Business Item #1

MURRAY

PUBLIC WORKS DEPARTMENT

Adoption of the Storm Water Master Plan

Committee of the Whole

Meeting Date: February 19, 2019

Council Action Request

Department Director Danny Astill **Phone #** 801-207-2404 **Presenters** Trae Stokes-City Engineer Tyler Allen-Consulting Engineer with Hansen, Allen & Luce **Required Time for Presentation** **Is This Time Sensitive** No **Mayor's Approval** **Date** February 5, 2019	**Purpose of Proposal** Storm Water Master Plan Adoption **Action Requested** Council to adopt the Storm Water Master Plan by Resolution **Attachments** Full master plan with executive summary Resolution to adopt the plan **Budget Impact** This plan identifies the priorities for the next 5-15 years specifically. A rate study will be completed once we have adopted the plan. **Description of this Item** From our last Master Plan adopted in 2011 and subsequent rate study, we have accomplished a number of large and small projects. This report updates our storm water model and identifies and prioritizes what projects that have been identified by our staff and consultant that need to be accomplished in a short and long term outlook. This report identifies the specific deficiencies and the recommended fixes with very rough cost estimates for each project as well as the time period recommended. This is a very large report, however the executive summary gives a good snapshot of the what the report contains and the projects which have been identified. Contained in EX-1-4. For additional information refer to Chapters 4-6 of the report. They contain the specific deficiencies and the recommended changes.

RESOLUTION NO. _____

A RESOLUTION ADOPTING THE 2019 STORM DRAINAGE MASTER PLAN UPDATE, ALSO REFERRED TO AS THE STORM DRAIN CAPITAL FACILITIES PLAN.

WHEREAS, the City owns infrastructure to provide residents and businesses of the City with storm water drainage; and

WHEREAS, the City is required to maintain, repair and improve the infrastructure in order to provide storm water drainage service; and

WHEREAS, the City, in anticipation of required infrastructure improvements, contracted for the preparation of a Capital Facilities Plan ("CFP"), entitled "Storm Drainage Master Plan Update" ("Update") analysis; and

WHEREAS, the City believes that the recommendations of the Update are necessary for the continued improvement of the City's storm water drainage infrastructure;

NOW, THEREFORE, BE IT RESOLVED by the Murray City Municipal Council that:

1. The Storm Drainage Master Plan Update recommends improvements to the City's storm water drain infrastructure that are in the best interest of the City, its residents and businesses;

2. It hereby approves and adopts the recommendations provided in the Storm Drainage Master Plan Update report; and

3. It authorizes the City's Public Works Director to commission an Impact Fee Study and Analysis based upon the Storm Drainage Master Plan Update report.

DATED this 19th day of February, 2019.

MURRAY CITY MUNICIPAL COUNCIL

_____

Dave Nicponski, Chair

ATTEST:

_____

City Recorder

MURRAY CITY

STORM DRAINAGE MASTER PLAN UPDATE

JANUARY 2019

HANSEN ALLEN & LUCE INC
ENGINEERS

ATTEST:

_____

City Recorder

MURRAY CITY

STORM DRAINAGE MASTER PLAN UPDATE

Tyler G. Allen, P.E.
Project Engineer

HANSEN ALLEN & LUCE INC
ENGINEERS

859 South Jordan Parkway, Ste. 200
South Jordan, Utah 84095

January 2019

ACKNOWLEDGEMENTS

Successful completion of this Master Plan was made possible by the cooperation and assistance of many individuals, including the Mayor of Murray City, City Council Members, and City personnel as shown below. We sincerely appreciate the cooperation and assistance provided by these individuals.

Murray City

Mayor

D. Blair Camp

City Council

Dave Nicponski
Dale Cox
Jim Brass
Diane Turner
Brett A. Hales

City Staff

Danny Astill, Public Works Director
Trae Stokes, City Engineer
Russ Kakala, Streets and Stormwater Superintendent
Mike Pfeiffer, P.E.

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EXECUTIVE SUMMARY

BACKGROUND

Murray City is located in the central region of Salt Lake County near the intersection of Interstate Highway 15 and Interstate Highway 215. Murray City has expanded a number of times over the past 100 years. Murray City has experienced development and existing storm drainage system changes since the last comprehensive storm drainage master plan was completed in April 2011. Murray city therefore requested that Hansen, Allen, & Luce, Inc. (HAL) provide an update to the master plan.

Murray City covers about 7,800 acres and has an elevation change of approximately 230 feet from 4,232 to 4,462 above mean sea level. The natural drainages of the study area are the Jordan River, Little Cottonwood Creek, and Big Cottonwood Creek (Figure EX-1). Both of the Cottonwood Creeks flow northwest and join the Jordan River in the northwest region of the City. The Jordan River flows north along the west side of Murray City. The East Jordan Canal and Jordan and Salt Lake Canal cut across the southeast corner of the City and flow to the northeast.

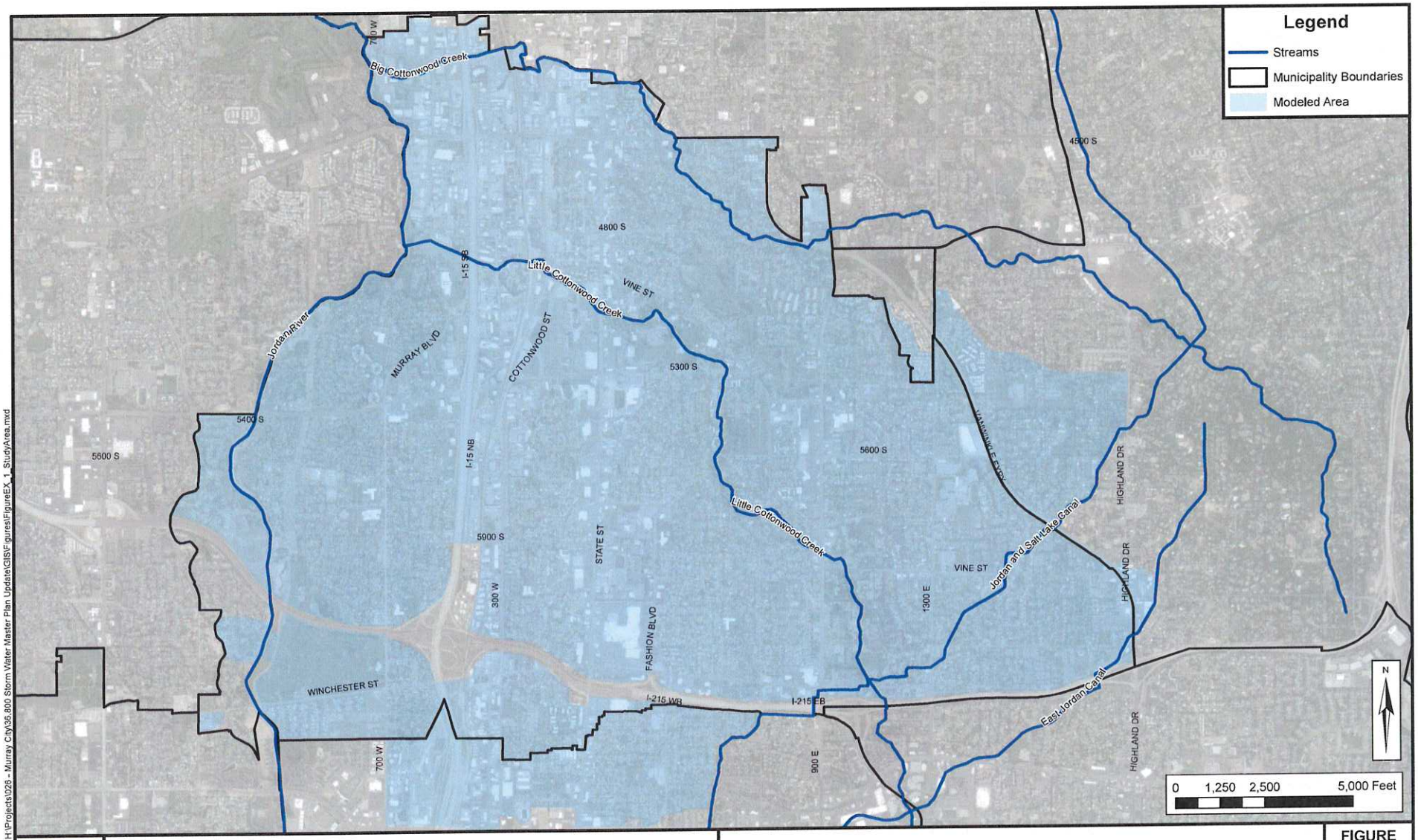
Storm water runoff is a difficult resource to manage. Unlike sanitary sewers and culinary water systems, there are no clearly defined minimum service requirements for storm water systems. Storm water flows are dependent on many complex time and spatially varied factors. Even a natural undeveloped drainage system is not static. Streams can erode in one section while depositing in another. Stream courses can also change alignment and cross section dramatically with just one storm runoff event. Urbanization compounds the problem and creates a need for a drainage system with the basic goals of managing nuisance water, protecting development from damage, and protecting downstream waters from adverse quality and quantity impacts. By maintaining a storm drainage master plan, Murray City is better prepared to manage their systems from an infrastructure aspect and a financial aspect required to maintain a complete system.

In addition, Murray City is included in the Authorization to Discharge Municipal Storm Water under Permit No. UTS000001 as managed under the Utah Pollutant Discharge Elimination System (UPDES). A new permit is under review by the state and the City has reviewed the new permit in anticipation that it may become official and has the desire to be proactive to meet the requirements.

PURPOSE

Murray City's Storm Drainage master plan serves four purposes:

1. Provide a storm water runoff model which predicts how the storm drainage system responds to design storm runoff events.
2. Identify and describe system deficiencies.
3. Identify alternative mitigation measures to control flooding during design storm runoff events.
4. Provide a capital improvement plan implementing the preferred drainage solutions.



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HANSEN ALLEN & LUCE inc ENGINEERS

Murray City
Storm Drainage Master Plan Update

Study Area

FIGURE EX-1

CRITERIA

The initial system is designed to convey flows generated by a minor storm. A minor storm is generally considered to have a 10-year recurrence interval (a 10% chance of occurrence). The storm drain pipes are typically considered a part of the initial system. The major system, which includes additional conveyance infrastructure such as channelized surface flow (roads, etc.), should generally be designed to convey storm runoff generated by a 100-year event (a 1% chance of occurrence) to protect homes from flooding.

METHOD

A storm water runoff model is used to simulate a rainstorm event over the city and predict the peak flow at specified locations. The predicted flows are then used to evaluate the ability of the storm water system to convey the storm water safely without damaging infrastructure or causing unsafe conditions. Using the City's GIS database and knowledge of the storm drain system (detention facilities, pipe type, size, age, and slope), the capacity and condition of the system is evaluated and compared to the predicted flows from the model to identify any deficiencies in the system. Deficiency and alternatives workshops were conducted with City staff to define problems and preferred improvement alternatives.

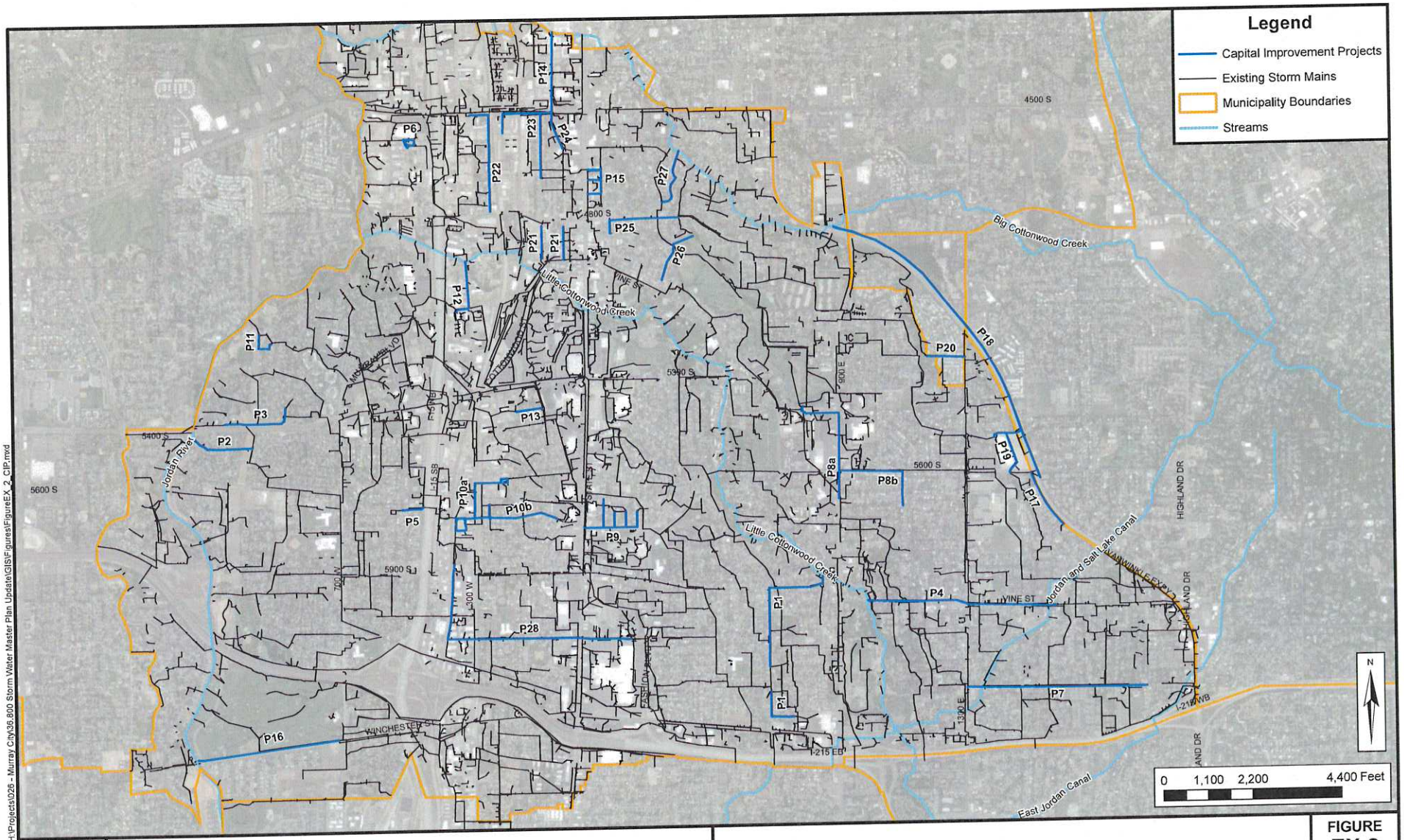
RECOMMENDED IMPROVEMENT PROJECTS

A compiled list of the recommended projects is provided in Table EX-1 locations proposed potential solutions to resolve the deficiencies. The project locations are shown on Figure EX-2 and the details are provided in the following table where the priority column identifies the time frame in which a project is expected to be completed as follows: A, 0 to 5 years; B, 5 to 10 years; C, beyond 10 years.

Table EX-1
Capital Improvement Plan

Project ID	Priority	Deficiency ID	Location	Total Cost
P1	A	D13	Labrum Ave to 725 E, 725 E from Labrum Ave to 5900 S, and 5900 S from 725 E to Little Cottonwood Creek	$2,227,000
P2	A	D23, D49	Walden Meadows Dr from 950 W to the Jordan River	$628,000
P3	A	D23, D49	Clover Meadow Dr to 5400 S and along 5400 S to 1020 W	$722,000
P4	A	D45, D46	Vine Street from Rodeo Ln to Little Cottonwood Creek	$500,000
P5	A	D21	Anderson Ave from Sanford Dr to Green St	$177,000
P6	A	D37	Storage lot at the intersection of Cherry St and Jensen Ln	$252,000
P7	B	D2, D3	6400 S from 1865 E to 1300 E	$1,292,000
P8a	B	D11	900 E and Woodoak Ln from 5700 S to 820 E	$1,563,000
P8b	B	D11	5600 S and 1080 E from 5730 S to 900 E	$769,000

Project ID	Priority	Deficiency ID	Location	Total Cost
P9	B	D17	5770 S from Wood Cir to State St, Lindon St from Lindon Way to 5770 S, Wood Cir, Hansen Cir, and Butler Cir	$875,000
P10a	B	D18, D19, D20	From the south end of Riley Ln to 300 W, then south to approximately 5750 S	$661,000
P10b	B	D18	5750 S from Nena Way to Utahna Dr	$442,000
P11	B	D51	Northwest corner of Spring Clover Dr through the residential lots to the bottom of Germaine Ave	$339,000
P12	B	D50	Vine St from 350 W to Commerce Dr and Commerce Dr from Vine St to the outfall to the Little Cottonwood Creek	$718,000
P13	B	D26	The southern leg of Woodrow St to Hillcrest Dr	$174,000
P14	B	D33, D34	Main St from 4500 S to Big Cottonwood Creek	$1,023,000
P15	B	D33	Brown St from McHenry St to Rainbow Dr, Rainbow Dr, McHenry, and 4675 S from State St to Brown St	$446,000
P16	B	D52	Murray Parkway Golf Course along Winchester from 700 West to about 1040 West and then North West through the Golf Course to the Jordan River	$2,068,000
P17	C	D5	West Side of Van Winkle from end of Fontaine Bleu to 5600 S	$321,000
P18	C	D6, D7, D8, D9	East Side of Van Winkle from 5600 S to 900E	$5,981,000
P19	C	D6, D7, D8, D9	From 5600 S through Gold's Gym parking lot and to project 3 at approximately 5465 S	$1,096,000
P20	C	D9	Pipe paralleling El Sendero from 1300 E to open channel	$594,000
P21	C	D29	Box Elder St and Alignment for the Downtown Redevelopment	$432,000
P22	C	D35	200 W from 4800 S to 4500 Frontage Rd and 4500 Frontage Rd from 200 W to 260 W	$964,000
P23	C	D33, D34	4500 Frontage Rd from 160 W to Main St, 160 W from 4630 S to 4500 Frontage Rd and Box Elder St from Miller St to 4500 S	$1,434,000
P24	C	D33, D34	Auto Blvd from 4600 S to 4500 S	$382,000
P25	C	D30	Center St from Division Ln to 4800 S and 4800 S from Center to Little Green	$663,000
P26	C	D28	Glen St from 5000 S to Clark St intersection to Little Green	$266,000
P27	C	D31	Meadowview Rd, Meadoway St, and Meadow Rd to Big Cottonwood Creek	$418,000
P28	C	D14	6100 S from just West of Fashion Boulevard to approximately 400 W, along the railroad tracks from 6100 S to 5850 S	$5,853,000
			TOTAL	**$33,280,000**



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Murray City
Storm Drainage Master Plan Update

Capital Improvement Plan

FIGURE EX-2

Costs of the recommended projects organized by priority can be seen in Table EX-2.

Table EX-2
Summary of Capital Improvements by Schedule

Prioritization	Time Frame	Preferred Alternative A Total Cost
A	Within 5 years	$4,506,000
B	5-10 years	$10,370,000
C	Beyond 10 years	$18,404,000
	Total	**$33,280,000**

SUMMARY OF RECOMMENDATIONS

It is recommended that Murray City:

- Review the new UPDES permit and anticipate potential changes to the Storm Water Management Plan to remain in compliance with the future permit.
- Review the "Guide to Low Impact Development within Utah" and implement the LID suggestions into City Policy.
- Maintain the current Storm Water Management Plan so it complies with the current effective UPDES permit.
- Implement the Capital Improvement Plan presented in Chapter 6.
- Continue to maintain the GIS storm drainage inventory.
- Continue design review and inspection policies that will ensure City design and construction standards are achieved.
- Continue to require new developments to reduce runoff to pre-construction levels.

CHAPTER 1 - INTRODUCTION

This master plan update report addresses existing and future storm drainage needs of Murray City. A previous storm drainage master plan update was completed by Hansen, Allen, & Luce, Inc. (HAL) in April 2011. This master plan update identifies both deficiencies previously identified in the 2011 Master Plan and those due to development since the 2011 Master Plan. Preferred solution alternatives are presented with cost estimates and a capital improvements plan is developed for the identified projects. Also included by request of the City are suggested locations for potential water quality improvements in the system.

Murray City's storm drainage master plan update serves four purposes:

5. Provide a storm water runoff model which predicts how the storm drainage system responds to design storm runoff events.
6. Identify and describe system deficiencies.
7. Identify alternative mitigation measures to control flooding during design storm runoff events.
8. Provide a capital improvement plan implementing the preferred drainage solutions.

For the 2011 Master Plan separate storm water models were prepared for eleven major drainage basins. HAL combined those separate storm drainage models of the City into a single citywide model for this update. ArcGIS 10.4 Geographic Information System (GIS) by Environmental Systems Research Institute (ESRI) was used as a spatial reference tool for development of the HEC-HMS models. The models, in conjunction with the GIS data, will help the City to continue to update and analyze the system for potential drainage deficiencies and facilitate the analysis and design of mitigation measures.

BACKGROUND

Murray City is located in the central region of Salt Lake County near the intersection of Interstate Highway 15 and Interstate Highway 215. Murray City has expanded a number of times over the past 100 years. Murray City has experienced development and existing storm drainage system changes since the last comprehensive storm drainage master plan was completed in April 2011.

Murray City covers about 7,800 acres and has an elevation change of approximately 230 feet from 4,232 to 4,462 above mean sea level. The natural drainages of the study area are the Jordan River, Little Cottonwood Creek, and Big Cottonwood Creek (Figure 1-1). Both of the Cottonwood Creeks flow northwest and join the Jordan River in the northwest region of the City. The Jordan River flows north along the west side of Murray City. The East Jordan Canal and Jordan and Salt Lake Canal cut across the southeast corner of the City and flow to the northeast (Figure 1-1).

Storm water runoff is a difficult resource to manage. Unlike sanitary sewers and culinary water systems, there are no clearly defined minimum service requirements for storm water systems. Storm water flows are dependent on many complex time and spatially varied factors. Even a natural undeveloped drainage system is not static. Streams can erode in one section while depositing in another. Stream courses can also change alignment and cross section dramatically with just one storm runoff event. Urbanization compounds the problem and creates a need for a drainage system with the basic goals of managing nuisance water, protecting

development from damage, and protecting downstream waters from adverse quality and quantity impacts.

SCOPE

The scope of this Storm Drainage Master Plan includes the following:

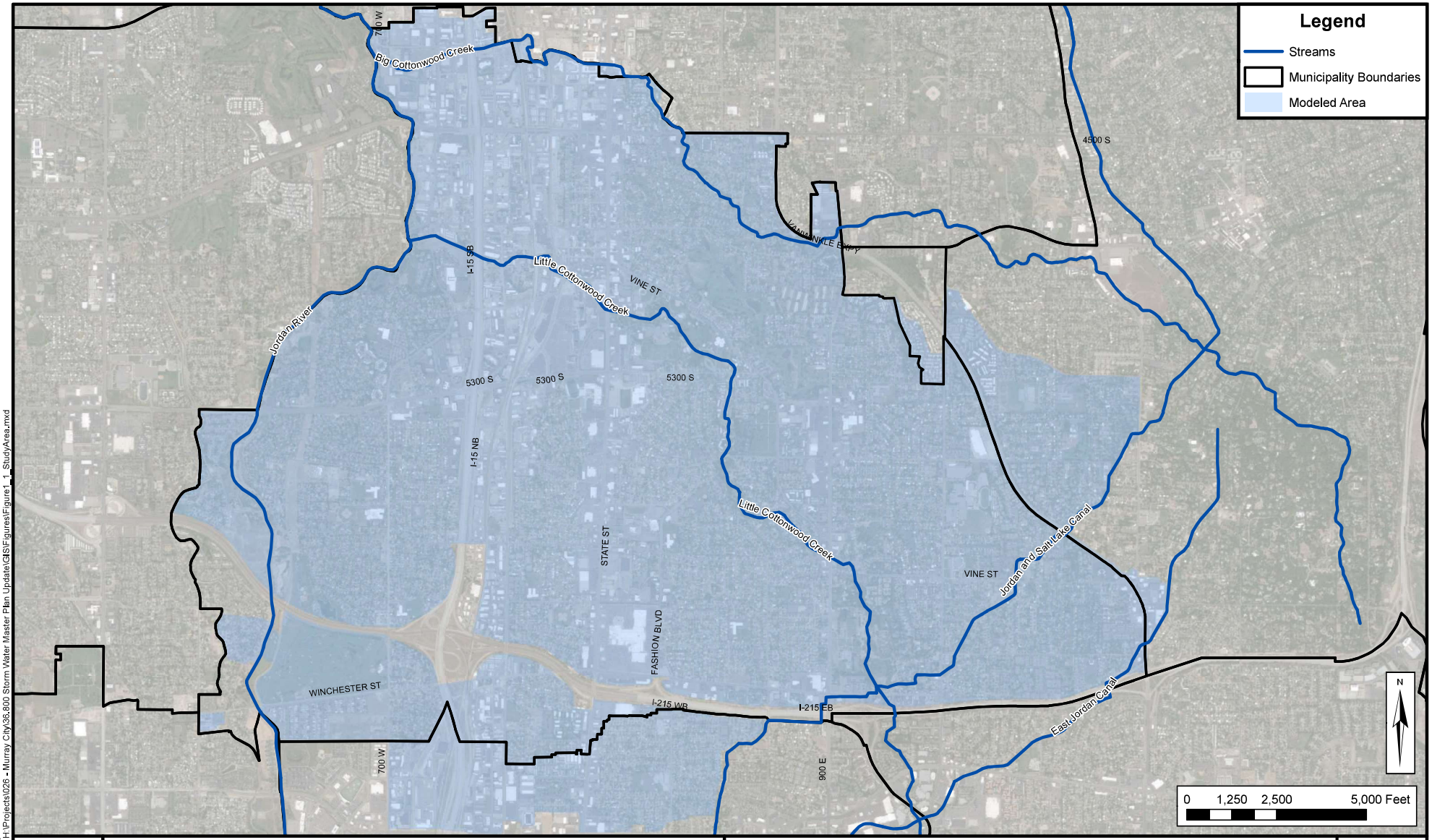
1. **Collect and review storm drainage data**, including additional drainage studies, Geographic Information System (GIS) data, as-built drawings, new developments, and any known storm drainage deficiencies from the City.
2. **Update the storm drainage system model** by updating areas of the city that have experienced development since the previous master plan, update the conveyances to reflect recent projects, compile the previous 11 separate models into a single City-wide model.
3. **Develop the Capital Improvement Plan** (CIP) by determining the design storm, applying the model flow results to the GIS inventory data, determining the capacities of the inventory conveyances using the Manning's equation for full pipe flow, identifying deficiencies in coordination with the City, developing and reviewing projects in coordination with the City, and estimating costs for the CIP.
4. **Prepare Master Plan Report**.
5. **Complete a Storm Water Rate Evaluation (Zion's Bank)** by gathering data including master plans, capital improvement plans, billing, and financial data. The required revenue will be determined, and a stormwater cost allocation developed for the storm water rates.

AUTHORIZATION

In March 2018, Murray City selected Hansen, Allen & Luce, Inc. (HAL) to assist them in updating the master plan of the City's storm drainage system. Development of the storm drainage master plan update was completed under the direction of, and in cooperation with City staff.

STUDY AREA

The complete master plan update study area includes area within Murray City boundaries and drainages tributary to areas of the City. The northern boundary of the study area reaches 3900 South. The southern boundary extends into Midvale City as far as 7200 South (Figure 1-1). The western boundary of the study follows along Murray City's western boundary. The eastern boundary of the study extends into part of Holladay City as far as Highland Drive and includes parts of Salt Lake County in between Murray City and Holladay City.



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HANSEN ALLEN & LUCE inc ENGINEERS

Murray City
Storm Drainage Master Plan Update

Study Area

FIGURE 1-1

CHAPTER 2 - STORM WATER QUALITY MANAGEMENT

STORM WATER MANAGEMENT PLAN REQUIREMENTS

In compliance with provisions of the Utah Water Quality Act, Title 19, Chapter 5, Utah Code Annotated 2004 and the Federal Water Pollution Control Act, Murray City is included in the Authorization to Discharge Municipal Storm Water under Permit No. UTS000001 as managed under the Utah Pollutant Discharge Elimination System (UPDES). The Permit became effective on September 5, 2013 and expired on September 4, 2018 (Utah Division of Water Quality, 2013).

A new permit is under review by the state. The City has reviewed the new permit in anticipation that it may become official.

The UPDES permit is intended to reduce discharge of pollutants through the storm drainage system to the maximum extent possible (MEP). The permit helps cities reduce pollutants by requiring a Storm Water Management Plan (SWMP) and offering suggestions of best management practices (BMPs). The minimum control measures required to be addressed in the SMMP are:

- Public Education and Outreach on Storm Water Implacts
- Public Involvement/Participation
- Illicit Discharge Detection and Elimination (IDDE)
- Construction Site Storm Water Runoff Control
- Long-Term Storm Water Management in New Development and Redevelopment (Post-Construction Storm Water Management
- Pollution Prevention and Good Housekeeping for Municipal Operations

Murray City has a SWMP in place which addresses these measures.

Also available for public review is the "Guide to Low Impact Development within Utah" which describes low impact development (LID) designs and best management practices, including the calculation of the 90th percentile storm event. Although the guide is not yet official, it is recommended that the City review and compare City policies with the guide in order to improve water quality and promote LID designs.

Expressing their desire to be proactive regarding water quality, the City has requested that HAL identify potential sites for water quality improvements if the need arises.

Water Treatment Structures

Outfall locations on conveyances larger than 18 inches in diameter were identified as potential water treatment locations. The capture of storm water runoff from the 90 percentile rainfall event on new development and redevelopment areas is expected to be required in the near future. Where it is infeasible to retain the 90th percentile storm onsite, alternative treatment means may be required. For this master plan, it is assumed that the water treatment structures, if used, will treat the storm runoff from the 90th percentile storm. The 90th percentile storm is less than a 2-year 24-hour rainfall depth and is about 0.6 inches of rain in the Salt Lake Valley

Locations for potential treatment structures on major outfalls through the City have been identified (see Appendix A). While the treatment locations are not included in the projects in Capital Improvement Plan (CIP), they provide the City with knowledge to plan ahead to meet potential permit requirements.

The water treatment structures are assumed to consiste of three manholes:

- **A Diversion Manhole** installed on the trunk line to divert low flows in the trunk line to a diversion pipeline ranging between 24 inches in diameter and 36 inches in diameter.
- **A Treatment Manhole** similar to the ADS Barracuda Stormwater Separator or the Oldcastle Dual-Vortex Separator (DVS). Cost estimates for the Oldcastle Dual-Vortex Separator were used.
- **A Junction Manhole** to reintroduce the treated flows back into the trunk line. This manhole could be replaced with a new outlet structure if the treatment structures are relatively close to the outfall location. This may be preferable if slopes in the trunk line are shallow.

Water treatment structures should be monitored and cleaned quarterly during the first year of installation to determine what frequency of cleaning is required to properly maintain the structures.

CHAPTER 3 - HYDROLOGY

This section describes the hydrologic analysis that was performed for the study area, which includes a discussion of 1) the frequency and duration of the design storm used in the analysis, 2) updating and development of drainage basin characteristics, and 3) the methodology and process behind the storm drainage models.

DESIGN STORM

Drainage Design Frequency

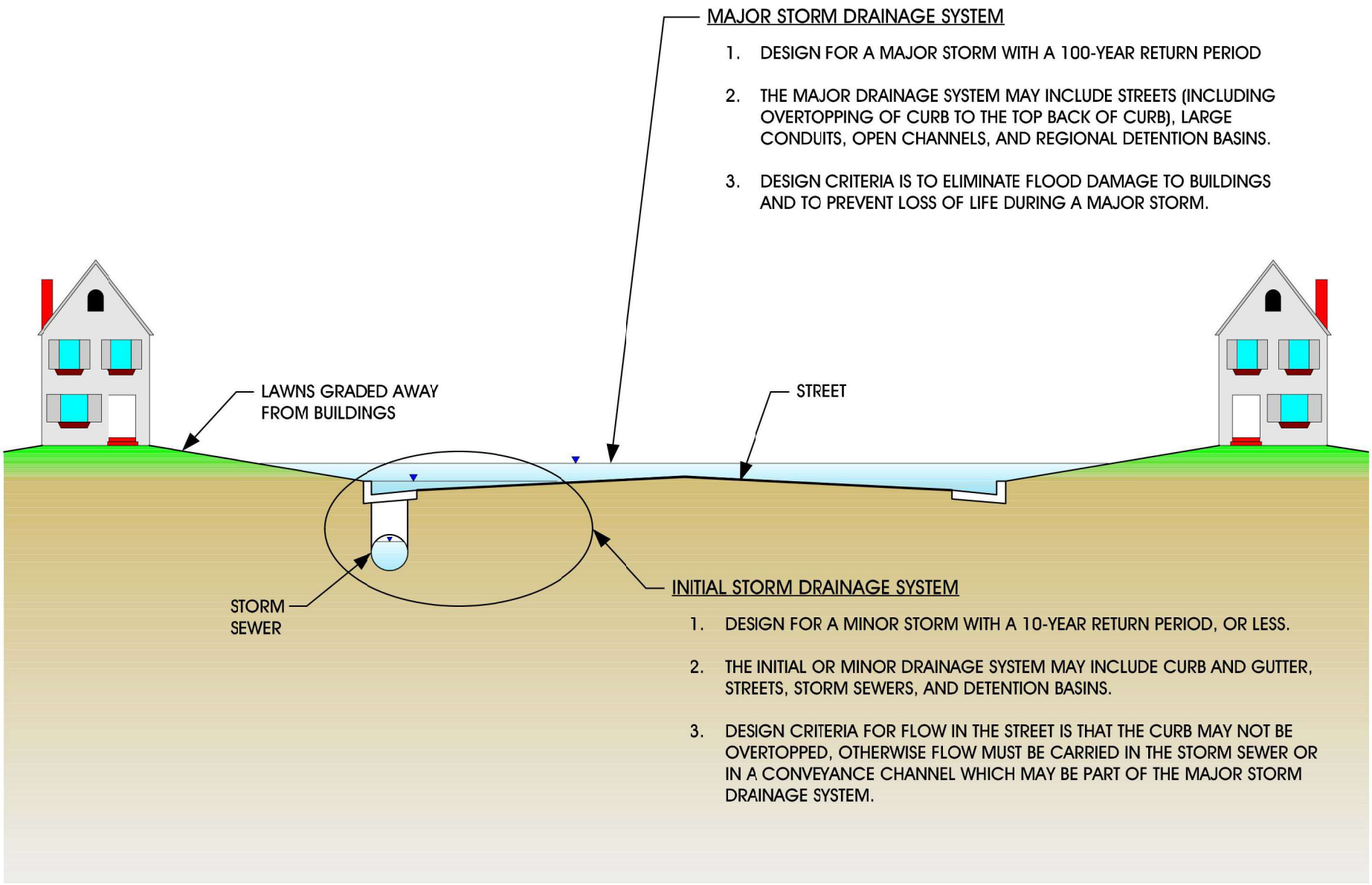
The approach selected by Murray City for determining the drainage design frequency is based upon methodology given in the Urban Storm Drainage Criteria Manual (Denver Regional Council of Governments, 2001). This manual defines the urban drainage system as follows:

> *"Every urban area has two separate and distinct drainage systems, whether or not they are actually planned for and designed. One is the initial system, and the other is the major system. To provide for an orderly urban growth, reduce costs to future generations, and obviate loss of life and major property damage, both systems must be planned and properly engineered."*

"The initial storm drainage system, sometimes referred to as the 'minor system,' is designed to reduce street maintenance costs, to provide protection against regularly recurring damage from storm runoff (of a 10-year recurrence interval or less), to help create an orderly urban system, and to provide convenience to the urban residents" (Denver Regional Council of Governments, 2001). Storm sewer systems are generally considered part of the initial storm drainage system. In conjunction with the initial storm drainage system, provisions should be made to avoid major property damage or loss of life from a major storm runoff event. Such provisions are considered to comprise the major storm drainage system. Please refer to Figure 3-1 which identifies the initial and major storm drainage systems described in the *Urban Storm Drainage Criteria Manual*.

The major storm drainage system in newly developing urban areas or business districts should generally be designed for the 100-year event with the objective to protect edifices (homes, buildings, etc.) from flooding. This does not mean that storm sewers (which are considered part of the initial storm drainage system) should be designed for the 100-year event. It means that the combination of storm sewers and channelized surface flow as part of a 100-year channel should be designed to accommodate the 100-year event. There appears to be general agreement among most major flood control agencies that in the design of the major storm drainage system for urban areas the 1-percent storm (100-year return period) should be used, except in the design of water impoundment structures that exceed a specified capacity. Dam design should comply with the requirements provided in the State of Utah Statutes and Administrative Rules for Dam Safety (UAC, 2018).

After consultation with City officials, the 10-year return period was chosen for determining the adequacy of the initial drainage system and this master plan effort focuses on the initial drainage system. The design storms were not altered for this master plan update.



HANSEN ALLEN & LUCE inc ENGINEERS	**Murray City - Storm Drainage Master Plan Update**	**Urban Storm Drainage Criteria**	**Figure 3-1**

Design Rainstorm

In 1999 Salt Lake County contracted with TRC North American Weather Consultants and Meteorological Solutions Inc. to complete an updated rainfall intensity duration analysis of Salt Lake Valley. The 1999 rainfall study performed an "analysis of valley-wide, warm season (March – October) precipitation, for use in runoff-related design consideration." The results of the study were summarized on "eighteen maps covering area rainfall at duration ranging from 15 minutes through 24 hours for return periods from 2 years to 100 years (Select maps located in Appendix B). A summary of design rainfall depths for various return periods for Murray City are shown on Table 3-1.

Table 3-1
10-Year Return Period Design Rainfall Depths

Rainfall Depth by Duration			
30-min	1-hour	3-hour	6-hour
0.72 inches	0.90 inches	1.15 inches	1.45 inches

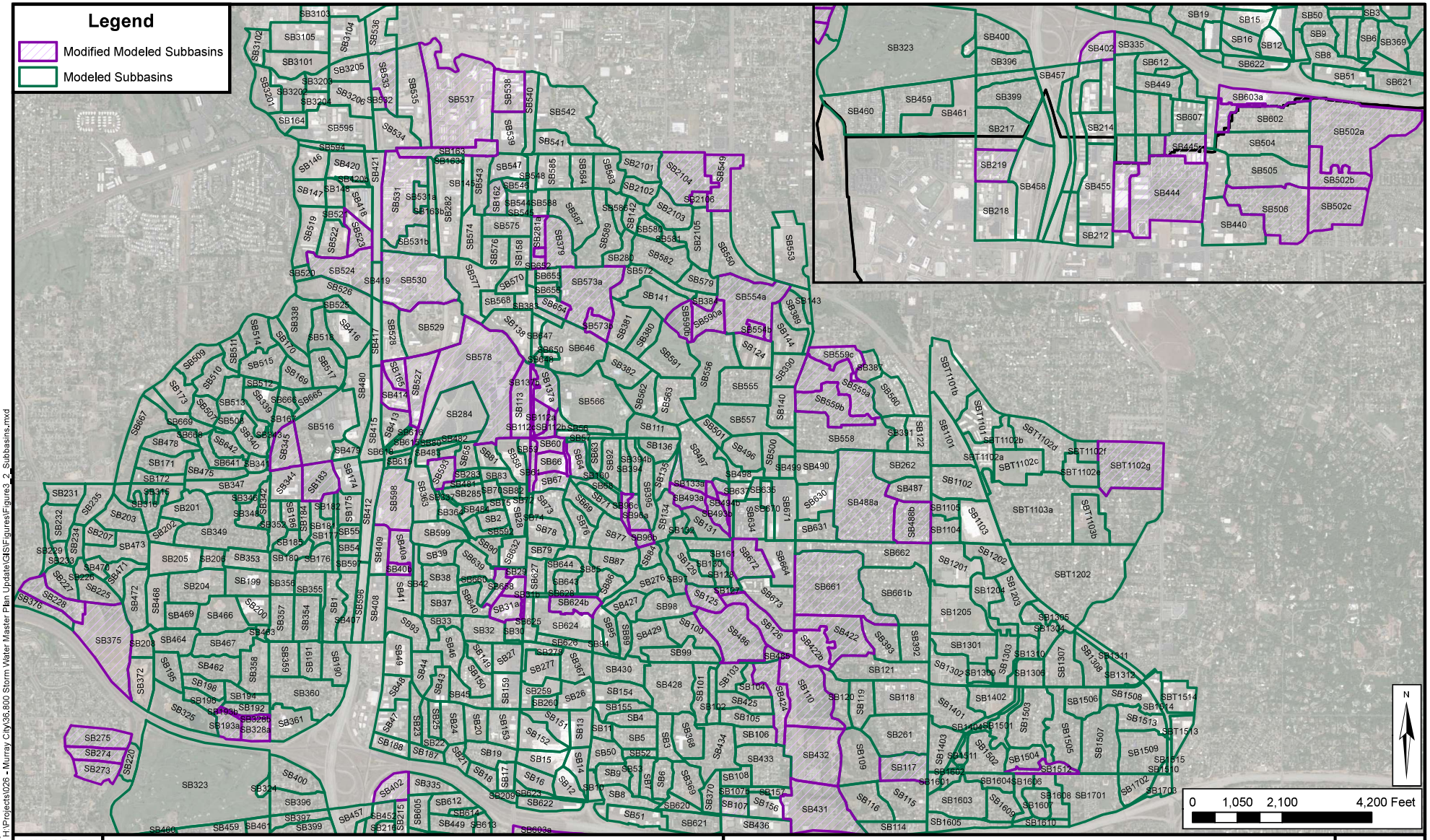
The storm duration that will produce the highest peak runoff flow rate is dependent on rainfall-duration relationships, the characteristics of the basin, and upon the level of detention storage. Generally speaking, the longer runoff takes to flow through a drainage basin or detention basin, the longer the critical storm duration. A duration sensitivity analysis of the hydrologic study area was performed in 2011 by successive model runs using 30-minute, 1-hour, 3-hour, and 6-hour storm durations. The storm duration producing the largest peak runoff for developed areas tributary to detention basins was typically the 1-hour storm. In some areas downstream from detention basins the 6-hour storm produced the largest peak runoff. Therefore, the 1-hour storm and 6-hour storms were used as the design storms for the master plan update.

To compute runoff from a given storm, the distribution of the rainfall through time must be known. Critical runoff events from urban areas along the Wasatch Front are caused by cloudburst type storms, characterized by short periods of high intensity rainfall. During the 1960s and early 1970s, Dr. Eugene E. Farmer and Dr. Joel E. Fletcher completed a major study of the precipitation characteristics for storms in northern Utah. In Davis County, Farmer and Fletcher (1971) examined rainfall gage records and classified storms based on whether the heaviest rainfall of the storm fell in the first, second, third, or fourth quarter of the storm period. Farmer and Fletcher found that "first and second quartile storms together comprise 76 percent of those storms containing a burst of 5-minute duration, with a 2-year recurrence interval and 92 percent of storms containing a burst of 10-minute duration, with a 10-year recurrence interval." Farmer and Fletcher developed model storms for first and second quartile storms. The second quartile storm distribution produces the higher runoff peaks and is the rainfall distribution used in this study for runoff hydrograph calculations.

DRAINAGE BASIN CHARACTERISTICS

A drainage basin is an area where all rainfall or snowmelt runoff within it will collect to a common point. Drainage basins may also be referred to as watersheds or catchments. Subbasins are smaller drainage basins located within a larger drainage basin. Subbasin boundaries depend upon both the topography and the location of storm drainage facilities. The subbasin boundaries delineated for the model are shown on Figure 3-2.

The 2011 subbasin characteristics were developed based on field observations, the 2009 Murray City aerial photographs, 4-foot elevation contour data, 0.5 meter elevation contour data, and soils coverage from the state GIS site which comes from the Natural Resource



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HANSEN ALLEN & LUCE INC ENGINEERS

Murray City
Storm Drainage Master Plan Update

Subbasins

FIGURE 3-2

Conservation Service database (NRCS, 2010). Developed areas were reviewed in this master plan update and subbasins were adjusted and added as needed. Modified subbasins are also shown on Figure 3-2. Subbasin characteristics included:

- Subbasin area
- Hydrologic Soil Type
- Percentage of impervious area
- SCS curve number
- Conveyance characteristics

Hydrologic characteristics of each subbasin are given in the model input files provided with this report. Subbasin identification numbers are labeled on Figure 3-2, except where labels would not fit. Identification numbers can also be seen on the attribute tables of the shapefiles provided with this master plan.

Subbasin Area

Subbasins were updated within the GIS database using topographic mapping and the locations of storm drainage facilities. Digital base mapping of the City consists of contours and physical features such as property lines and streets. Site visits were made to verify drainage patterns in areas where the drainage directions could not be determined using the available mapping. Subbasins vary in size depending upon the level of development within the subbasin, the extent of storm drainage facilities in the area, and the locations for which hydrographs were needed.

Hydrologic Soil Type

Hydrologic soil type is a general indication of the soil's infiltration capacity. Soils are assigned a hydrologic type of A, B, C, or D by the Natural Resource Conservation Service (NRCS). Soils of hydrologic type A have the highest infiltration rate, and therefore produce the least amount of runoff. Soils of hydrologic type D have the lowest infiltration rate, and therefore produce the highest amount of runoff. Soils in the study area are mostly type A, C, and D. Each subbasin was assigned a hydrologic soil type based upon the NRCS mapping.

Impervious Area

Impervious areas within subbasins that have been developed since 2011 were updated using the 2017 aerial photography and impervious area mapping from Murray City. The impervious area was divided into two components, directly connected impervious areas and unconnected impervious areas. Directly connected impervious areas have a direct path for runoff to flow to a conveyance such as a pipe, gutter, or channel. Directly connected impervious areas include roadways, parking lots, driveways, and sometimes the roofs of buildings. Runoff from unconnected impervious areas cross pervious areas before reaching a conveyance. Examples of unconnected impervious areas include sidewalks that are not adjacent to the curb, patios, sheds, and usually some portion of the roofs of buildings.

It is important to distinguish between directly connected and unconnected impervious areas because runoff from directly connected impervious areas reaches the drainage conveyance system quickly and usually determines the magnitude of the peak flow rate upstream from detention. Impervious areas such as back yard patios, which drain to grassed or landscaped areas impact storm runoff peak flows much less than directly connected impervious areas.

Based upon field observations, the directly contributing impervious area for a typical residential lot in Murray City generally includes the majority of the driveway and 26 percent of the home

and garage area. The runoff from the remaining 74 percent of the home and garage area typically flows over pervious areas before reaching the street. Please note that roughness coefficients (Manning's n values) for sheet flow were estimated using the information on page 3-3 of Technical Release-55 (TR-55), which can be found in Appendix B.

SCS Curve Number

Each basin was assigned an SCS (Soil Conservation Service) curve number. The curve number describes the relationship between precipitation and runoff for the pervious and unconnected impervious portions of the subbasin. Curve numbers range from 0 to 100. Areas with high runoff rates have high curve numbers. Areas that are more pervious have lower curve numbers. For example, parking lots and other impervious surfaces have curve numbers of about 98, whereas pervious areas such as fields, lawns, and gardens, typically have curve numbers between 70 and 89. Curve numbers for each subbasin were estimated using a methodology presented by the Soil Conservation Service (SCS, 1972).

Residential areas usually have C type soils due to imported topsoil. C type soils in residential areas have a curve number of 74. Because much of the study area includes residential areas, a conservative minimum SCS curve number of 74 was applied to the entire area whenever calculated curve numbers were below that value.

Conveyance Characteristics

Storm drainage conveyance characteristics were estimated based on available system information using storm drainage facilities mapping and available drawings, field observations of the type and size of the conveyance, and approximate slope as determined from the contour data in conjunction with given storm drain depths.

Future Land Use and Hydrologic Characteristics

Most of Murray City has been developed. New development is required to reduce the generation of post-construction stormwater runoff to preconstruction levels. The reduction in runoff may utilize pervious areas for stormwater treatment and infiltration. Requiring development to reduce runoff to pre-development levels means development will not worsen existing deficiencies or create new deficiencies in the existing models.

STORM DRAINAGE UPDATE MODELS DEVELOPMENT

Methodology

The software used to model the storm drainage is the United States Army Corps of Engineers (USACE) Hydrologic Modeling System (HEC-HMS). HEC-HMS calculates peak flows and runoff hydrographs for all model elements including subbasins, reaches, junctions, and detention basins. Delineation of subbasins and determination of subbasin and reach characteristics were performed using ArcGIS. Subbasins were modeled using the SCS curve number loss method and the kinematic wave transform method.

Modeling Existing Conditions

The existing system model was updated to identify existing deficiencies in the storm drainage system. Conveyances included in the models were those which receive drainage from at least one subbasin. Modeling of the existing drainage system is presented in Chapter 5.

Modeling Future Conditions

The City currently requires new development to reduce post-construction runoff to that of pre-development conditions. This is more conservative than the previous requirement of 0.2 cfs/acre from parcels with new development. As any undeveloped areas develop in the future, they will be required to restrict runoff to current conditions, thus not adversely affect the current storm drain system or the proposed improvements.

Computation of Runoff Hydrographs

Hydrographs were computed for each subbasin, conveyance, junction, detention basin inlet, and detention basin outlet. The maximum value from each hydrograph is the peak runoff flow rate. Hydrographs were calculated for the 1-hour storm and 6-hour storms. The highest peak flow rate identifies the critical storm duration and is the flow rate used for design or evaluation of that element in the model.

The predicted peak storm runoff flow rates were compared to the capacities of the analyzed conveyances to determine where problems might exist. Peak runoff flow rates for each conveyance are provided in Appendix D. An electronic copy of the storm drainage models along with the HEC-HMS installation software, GIS data, and backup information are included with this report in Appendix F.

CHAPTER 4 – EXISTING STORM DRAINAGE SYSTEM

Little Cottonwood Creek, Big Cottonwood Creek, the Jordan River, and the Jordan and Salt Lake City Canal act as outlets for storm drainage facilities in Murray City. Little Cottonwood Creek and Big Cottonwood Creek are tributary to the Jordan River. Modeled conveyances, detention basins, and drainages of the existing storm drainage system are shown on Figure 4-1.

OUTFALL DRAINAGES

Little Cottonwood Creek

Little Cottonwood Creek flows through approximately 4.5 miles of Murray City from Union Park Avenue and I-215 to the Jordan River at 4800 S. It is conveyed through the City by a series of open channels and road crossing structures before discharging to the Jordan River.

Big Cottonwood Creek

Big Cottonwood Creek flows through approximately 4.2 miles of Murray City from 1300 E and 4705 S to the Jordan River at 4200 S. It is conveyed through the City by a series of open channels and road crossing structures before discharging to the Jordan River.

Jordan River

The Jordan River flows through approximately 4.6 miles of Murray City.

Jordan and Salt Lake Canal

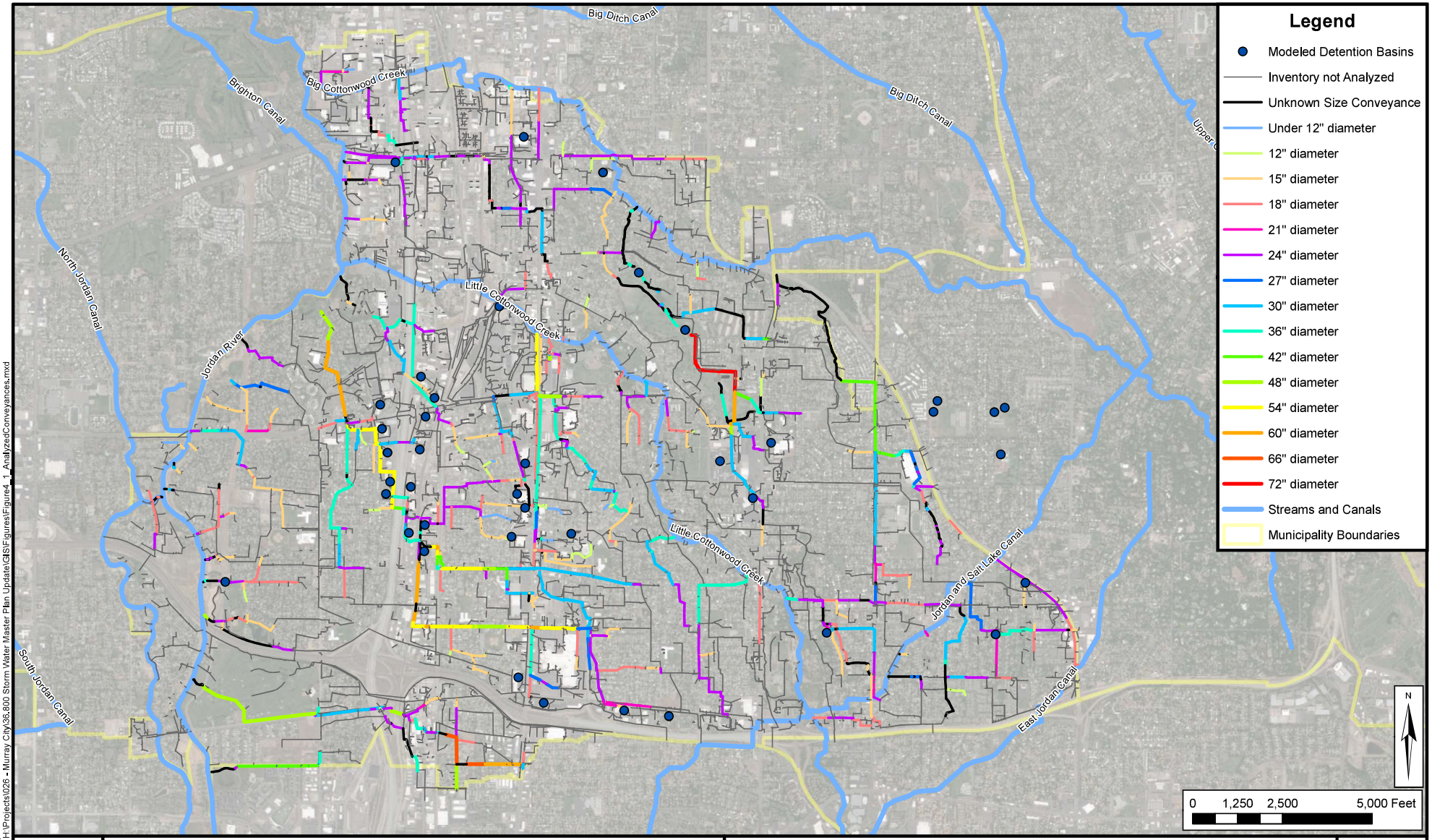
The Jordan and Salt Lake Canal flows through approximately 1.9 miles of Murray City from 900 E and I-215 northeast to Van Winkle. The canal is conveyed through a series of open channels and culverts before exiting the City boundary. It must be noted that although the canal currently is part of the storm drainage system (for older irrigation pipes which also convey storm drain runoff), the canal cannot be used as an outlet for future storm drain projects.

DETENTION

Existing detention basin locations are shown on Figure 4-1. Stage capacity and discharge data were estimated by field measurements, contour data, available design drawings and the City's 0.2 cfs/acre maximum discharge requirement. The stage storage data is included in Appendix C.

STORM DRAIN CONVEYANCES

Capacities of storm drainage pipes were estimated based upon size, slope, material type, and the Manning's equation. Where known pipe slope was not available, slope was estimated based on the contour data and pipe depth. In some cases adverse slopes were shown for the conveyance. No conveyance capacity was calculated if the pipe was determined to have an adverse slope. Pipes with adverse slopes likely are missing data and may actually have sufficient slopes. Estimated pipe capacities are based on conceptual level engineering and do not consider detailed inlet capacity and downstream restrictions. Estimated capacities also do not consider allowable surcharging that might provide additional capacity. While the estimated capacities may not be precise, they are consistent with the precision of the runoff estimates and



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Murray City
Storm Drainage Master Plan Update

Analyzed Storm Drain Conveyances

FIGURE 4-1

are sufficient for drainage master planning efforts. Capacities of modeled existing storm drains can be found in Appendix B and are also included in the shapefiles included in Appendix F.

CHAPTER 5 - STORM DRAINAGE ANALYSIS

ADEQUACY OF STORM DRAINAGE FACILITIES

The storm drainage criteria established as part of this study includes that the initial storm drainage system should be designed for the 10-year storm runoff event. The system was not analyzed for the 100-year storm runoff event. The combination of the storm drain pipes and the curb and gutter should convey the runoff from the 10-year storm runoff event without overtopping the curb.

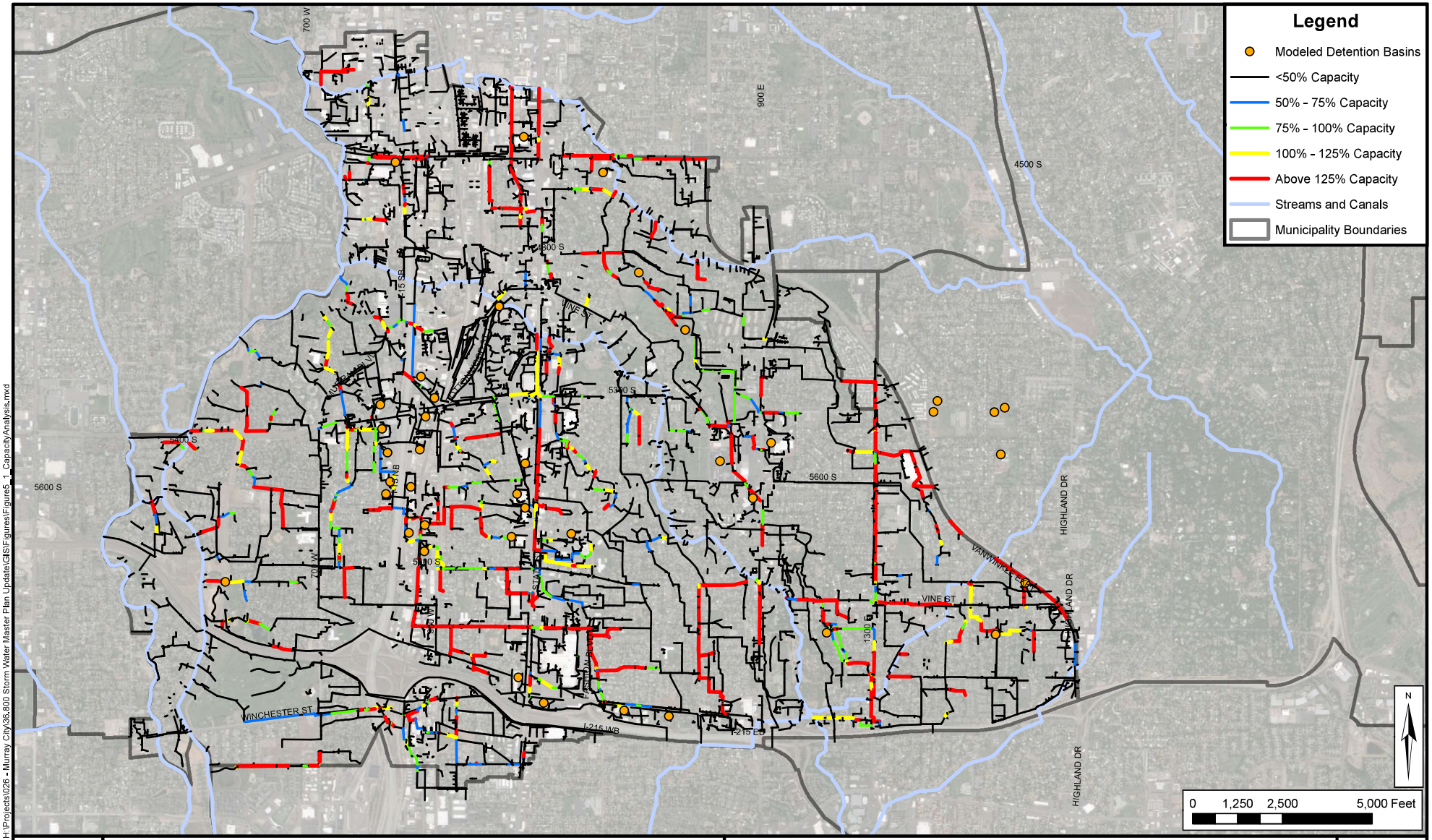
SYSTEM ANALYSIS

The peak flows for each conveyance was compared to the capacity of the conveyance and shown as a percentage of capacity on Figure 5-1. A single pipe with limited capacity does not necessarily represent a deficiency. Many pipes have very flat slopes that show extremely low calculated capacities. However, as the pipe becomes full the hydraulic grade line will usually exceed that of the slope of the pipe, creating conditions with allow for larger flows. Some pipes are also short enough that incoming flows do not reach the normal depth before exiting the conveyance to downstream conveyances with higher capacities. Therefore, only chains of conveyances with steady flows above capacity are indicative of deficiencies.

STORM DRAINAGE DEFICIENCIES

Storm drainage deficiencies were identified by using the system analysis described above and by collaborating with Murray City to identify known problem areas where frequent flooding occurs.

Storm drainage deficiencies are described in Table 5-1 and shown on Figure 5-2. Table 5-1 also includes a description of the location, the modeled conveyance identification number, the peak flow rates for a 10-year storm for existing conditions, and the existing 10-year capacity of each inventory conveyance.



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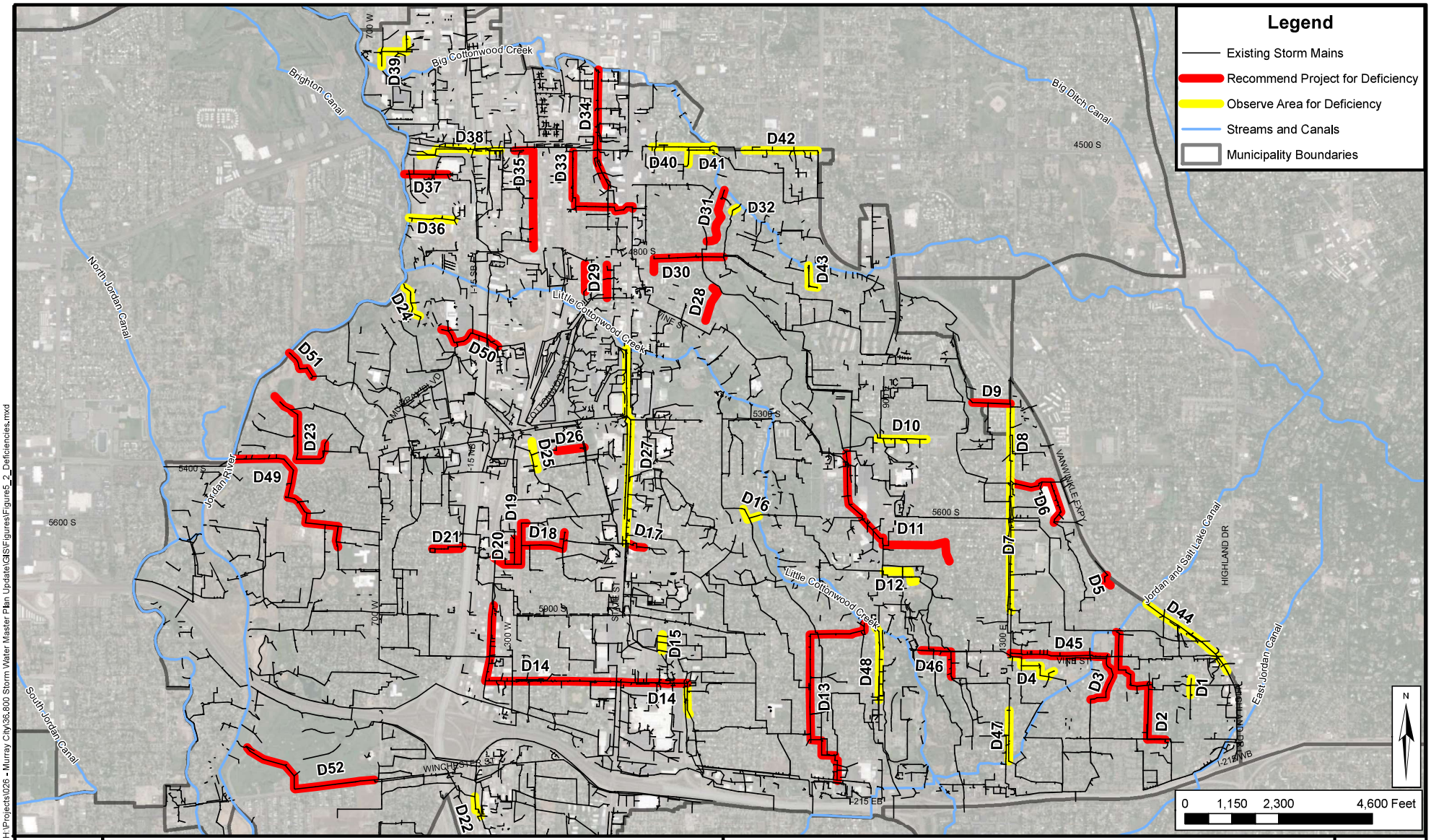
System Capacity Analysis

FIGURE 5-1



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Storm Drainage Master Plan Update

Deficiencies

FIGURE 5-2

Table 5-1
Storm Drain Deficiencies

Deficiency ID	Location	Model ID	10-yr Flow (cfs)	Conveyance Capacity (cfs)	Deficiency Description	Proposal
D1	West end of Jeremy Dr to Jeremy Ct	CN1513	20.64	6.4	Peak flow from the 10-year storm is greater than the capacity of the existing pipe.	Watch
D2	6400 S and Tanner Ln, west of Shenandoah Park Ave to New Haven Dr, Haven Chase Ln, Haven Moor Cir, Steeple Chase Ln to Fontaine Bleu	CN1307 CN1505b CN1505c CN1512	31.7 32.1 20.2 20.4	18.6 7.7 14.9 10.9	Peak flow from the 10-year storm is greater than the capacity of the existing pipes. Maintenance and access problems also exist.	Project
D3	Line Parallel to Rodeo from Lorreen Ct to Vine St	CN1302c CN1503b	29.1 31.2	6.3 - 51.7 23.3 - 42.6	Peak flow from the 10-year storm is greater than the capacity of the existing pipes. Maintenance and access problems also exist.	Project
D4	Vineway Cir to Amesbury Cir to 1300 E	NA	NA	NA	Local drainage issues and lack of storm drains in the area with downhill cul-de-sacs may cause problems.	Watch
D5	End of Fontaine Bleu Dr	NA	6.0	NA	Flooding frequently occurs at the end of Fontaine Bleu. The final terminus for the storm drain does not connect to any other conveyance facilities. Inlets have been improved since the 2011 Master Plan.	Project
D6	Waterbury Way and 5600 S, through Gold's Gym parking lot and Merritt Cir	CN1103 CN1103c	164.1 110.9	15.6 - 69.9 9.0 - 77.2	Peak flow from the 10-year storm is greater than the capacity of the existing pipes. Flows east of Van Winkle contribute to the capacity issues.	Project
D7	1300 E from 5935 S to Merritt Cir	CN1103b CN1104 CN1201 CN1205	82.2 71.6 43.5 37.2	34.7 - 130.4 32.5 - 34.9 26.2 - 32.7 16.7 - 24.3	Peak flow from the 10-year storm is greater than the capacity of the existing pipes.	Watch
D8	1300 E from Merritt Cir to Cabrito St	CN1101b CN1102	273.1 247.3	20.4 - 66.8 52.4	Peak flow from the 10-year storm is greater than the capacity of the existing pipes.	Watch
D9	South of El Sendero Cir	CN 387 CN122	290.3 304.1	56.6 77.8	Peak flow from the 10-year storm is greater than the capacity of the existing pipe.	Project
D10	Approximately along 5300 S from Revere Dr to 900 E	CN362	27.4	7.4 - 48.6	Peak flow from the 10-year storm is greater than the capacity of the existing pipe.	Watch

Deficiency ID	Location	Model ID	10-yr Flow (cfs)	Conveyance Capacity (cfs)	Deficiency Description	Proposal
D11	Approximately from 5700 S and Marco Rd to 800 E and Woodoak	CN263 CN635 CN262 CN181 CN259 CN260	100.6 90.4 87.5 88.1 79 56.1	48.7 - 364.2 31 26.3 70.1 24 20 - 71.1	Peak flow from the 10-year storm is greater than the capacity of the existing pipes through commercial development. The residential area lacks storm drains.	Project
D12	Birchwood Drive from Hyland Lake Dr to 900 E	NA	NA	NA	Area lacks sufficient City-owned storm drainage.	Watch
D13	725 E from Winchester to 5900 S and along 5900 S to Glen Oaks St	CN273 CN274 CN14 CN275 CN276 CN15 CN278 CN13 CN279 CN12 CN280 CN281	27.8 47.3 49.8 51.9 52.7 65.8 71.7 75 77.7 77.1 78.2 82.9	11.2 9.6 - 28.7 11.3 11.4 - 13.4 15.1 - 15.8 16.8 - 30.9 8.1 47.9 29.0 - 64.3 41.8 32.1 - 49.4 176.9 - 177	Peak flow from the 10-year storm is greater than the capacity of the existing pipes. A detailed analysis of the 725 E storm drain system was completed by HAL in May 2008.	Project
D14	Fashion Blvd. from 6220 S to 6100 S, 6100 S to approximately 400 E, along the railroad tracks from 6100 S to 5850 S	CN455 CN457 CN461 CV636 CV637 CN447 CN468 CN469 CN470 CN471 CN475 CN476 CN477 CN478	37.5 44.8 62.5 63.3 62.5 109 217.4 230.8 228.2 237.5 251.9 253.8 262.8 262.7	17.6 - 18.4 17.6 - 18 21.3 - 21.4 13 7.1 - 9.8 33.7 - 111.4 58 - 66.4 47.1 - 59.1 60.6 - 80.6 11.8 - 58.2 64.9 - 104.1 26.7 - 106.3 45.9 - 75.3 75.2 - 104	Peak flow from the 10-year storm is greater than the capacity of the existing pipes; however, Murray City has not received reports or witnessed any problem areas along this conveyance. It is believed that there may be incidental detention located within commercial areas that drain to this line that are not accounted for in the model. It is recommended that a study be completed that would determine what detention is occurring at this location to ensure that future construction and improvements restrict the flow to this portion of the system to existing flows. Pipes are originally CMP pipes that have been lined. The City has indicated that the liner has aged and is in need of replacement in the near future.	Project
D15	200 E from 5950 S to 6000 S	NA	NA	NA	Road lacks adequate storm drainage.	Watch

Deficiency ID	Location	Model ID	10-yr Flow (cfs)	Conveyance Capacity (cfs)	Deficiency Description	Proposal
D16	Avalon Dr and Kenwood Dr to 5600 S and Little Cottonwood Creek	NA	NA	NA	The existing irrigation line receives storm runoff from this area.	Watch
D17	Connection from Lindon St to State St at approximately 5700 S	CN528	7.3	1.2 - 7.8	Peak flow from the 10-year storm is greater than the capacity of the existing pipes. Upstream conveyances were not modeled but the City has noted previous problems.	Project
D18	From Emerald Isle Ln and Topowa Dr to Jefferson Detention Basin	CN501 CN489 CN491 CN492 CN494	9.7 24.5 37.8 70.1 81.5	8.9 4 - 16.7 24.7 14.9 - 17.5 20.3	Peak flow from the 10-year storm is greater than the capacity of the existing pipes. Maintenance and access problems exist in the area.	Project
D19	Railroad from 5620 S to 5700 S	CN500	31.8	23.4	Peak flow from the 10-year storm is greater than the capacity of the existing pipe. The conveyance is too close to the railroad.	Project
D20	300 W from 5600 S to approximately 5800 S	CN493	15.5	2.5 - 19.3	Peak flow from the 10-year storm is greater than the capacity of the existing pipe.	Project
D21	Anderson Ave and 590 W to Anderson Ave and Green St	CN537 CN536	4.9 12.1	0.9 - 3.3 1.1 - 4.5	Murray City has noticed problems at this location.	Project
D22	400 W from approximately 6600 S to 6500 S	CN547	75.5	66 - 112.6	Peak flow from the 10-year storm is greater than the capacity of the existing pipes and curb and gutter.	Watch
D23	From Lucky Clover Ln to Clover Meadow Dr, to 5400 S, then north to Sunberry Dr then to Murray Parkway Ave	CV576 CV577 CV566 CV567 CN359	8.2 14.9 14.1 14.4 25.2	6 - 9.7 4.4 - 5.2 1 - 4.6 5.5 - 6.3 18 - 22	Peak flow from the 10-year storm is greater than the capacity of the existing pipes. The City has noticed flooding in this area and noted that maintenance and access problems exist.	Project
D24	Hunters Woods Apartments (Riverside Dr) to outlet	CN356	23.8	6.3 - 32.4	The City has noticed flooding problems in the area along the open channel ditch.	Watch
D25	Riley Ln from 5325 S to American Ave	NA	NA	NA	The area lacks storm drainage to collect runoff from the east.	Watch
D26	Woodrow St to Hillcrest Dr	CN515	NA	NA	The area lacks storm drainage.	Project
D27	State Street from Stauffer Ln to outlet	CN432 CN409 CN431 CN61 CN402 CN113	54.6 55.9 65.1 65.9 141.1 196.4	36.1 - 36.5 35.6 - 41.5 45.9 - 46.5 51.2 - 220.9 135.7 120.2 - 179.3	Peak flow from the 10-year storm is greater than the capacity of the existing UDOT conveyances. These conveyances receive flow from several different conveyances at this point.	Watch

Deficiency ID	Location	Model ID	10-yr Flow (cfs)	Conveyance Capacity (cfs)	Deficiency Description	Proposal
D28	Glen St from 5000 S to Clark St	NA	NA	NA	The area lacks storm drainage.	Project
D29	Box Elder St and Poplar St from approximately 4850 S to Vine St	NA	NA	NA	The future City center redevelopment will require some new storm drainage.	Project
D30	Division Ln and Center St to 4800 S then to Cross Creek Ln	CV603 CV605	15.8 15.7	4.7 - 18.6 12.4	Peak flow from the 10-year storm is greater than the capacity of the existing pipes.	Project
D31	Meadowview Road, Meadoway St, and Meadow Road	NA	NA	NA	Area lacks storm drainage.	Project
D32	Shamrock Dr creek crossing near 400 E	CV633	32	21	Peak flow from the 10-year storm may be greater than the capacity of the culvert crossing.	Watch
D33	Rainbow Dr and State St to 4500 S and the Railroad	CN391 CN388 CN163	22.5 22.4 30	2.3 - 36 6.4 - 14.2 6 - 37.9	Peak flow from the 10-year storm is greater than the capacity of the existing pipes. The pipes are not owned by Murray City.	Project
D34	Auto Blvd. from 4600 S to Main Street and Big Cottonwood Creek	CN178 CN382 CV572 CV573 CN386	37.1 44.2 42.8 39.4 41.9	17.2 3.8 - 28.3 10.4 - 17.4 5.6 2.8 - 63.5	Peak flow from the 10-year storm is greater than the capacity of the existing pipes.	Project
D35	200 W from 4800 S to 4500 Frontage Rd and 4500 Frontage Rd to 260 W	NA	NA	NA	The area lacks storm drainage.	Project
D36	4700 S from Cherry St to outlet	CN343 CN344	9.1 13.4	5.1 - 18.2 5 - 16	Peak flow from the 10-year storm is greater than the capacity of the existing pipes. The city has noted problems here.	Watch
D37	Cherry St and Riverside Dr to the Jordan River	CN11 CN345	6.3	NA	The City has noticed flooding problems in the area, possibly due to local drainage problems.	Project
D38	4500 S from Commerce Dr to Riverside Dr	CN348 CV646 CV571	27.3 27.1 37.8	2.1 - 11.6 3.4 - 6.9 6.2 - 40.4	Peak flow from the 10-year storm is greater than the capacity of the existing pipes.	Watch
D39	4170 S and 600 W to 700 W	CN3105 CN3101	48.3 50.9	8.8 - 9.6 12.9 - 14	Peak flow from the 10-year storm is greater than the capacity of the existing pipes.	Watch
D40	North side of 4500 S from Fairbourne Ave to Big Cottonwood Creek	CN383 CN384	40 39.7	8.3 - 12.4 15.3 - 31.5	Peak flow from the 10-year storm is greater than the capacity of the UDOT existing pipes.	Watch
D41	Atwood Blvd and the south side of 4500 S from Atwood Blvd to Big Cottonwood Creek	CN584	6.8	1.5 - 4.3	Peak flow from the 10-year storm is greater than the capacity of the existing pipes.	Watch

Deficiency ID	Location	Model ID	10-yr Flow (cfs)	Conveyance Capacity (cfs)	Deficiency Description	Proposal
D42	4500 S from Vanwinkle Expy to Triton Dr	CN2104 CN2101	12.7 34.6	6.1 - 10 14 - 21.7	Peak flow from the 10-year storm is greater than the capacity of the UDOT existing pipes.	Watch
D43	4800 S from Three Fountains Dr to Mill Race Ln then to Big Cottonwood Creek	CN4477	26	6.8 - 18.3	Peak flow from the 10-year storm is greater than the capacity of the existing pipes.	Watch
D44	Van Winkle Expy from 6150 S to approximately 5950 S (Jordan and Salt Lake Canal)	CN1311c CN1311b CN1305	45.7 52.9 71.2	10 - 16.6 8 10.6 - 29.6	Peak flow from the 10-year storm is greater than the capacity of the existing conveyances along the UDOT expressway.	Watch
D45	Vine Street from 1600 E to 1300 E	CN1302b	28.1	6 - 18.7	Peak flow from the 10-year storm is greater than the capacity of the existing pipes.	Project
D46	Moffat Farm Ln to Vine St then Vine St to Little Cottonwood Creek	CN119b CN120 CN120c	25.7 34 41.3	2.1 - 33 9.3 - 13.5 17.2	Peak flow from the 10-year storm is greater than the capacity of the existing pipes.	Project
D47	1300 E from Maplewood Dr to the Jordan and Salt Lake Canal	CN1403 CN1601	31.5 12.5	16.8 - 18.7 9.1 - 14.5	Peak flow from the 10-year storm is greater than the capacity of the existing UDOT pipes.	Watch
D48	900 E from 6270 S to Vine St	CN4472 CN4473	26.8 40.3	9.2 - 16.5 35 - 49.3	Peak flow from the 10-year storm is greater than the capacity of the existing UDOT pipes.	Watch
D49	800 W from Anderson Ave through the residential area to 5400 S and 970 W then to the Jordan River	CN131 CN132 CN230 CN219 CN221 CN220 CN222 CN225 CN217 CN218	9.2 12.8 12.8 13.4 13.4 13.4 28.6 28.2 33.9 37.7	5.8 4.5 - 8.4 4.5 18.2 25.3 15.5 13.6 24.6 3.9 - 41.1 14.3	Peak flow from the 10-year storm is greater than the capacity of the existing pipes. The City has noted adverse slopes and significant sedimentation in the pipes.	Project
D50	Vine Street and 350 W to Galleria Dr, to Murray Blvd, then along Murray Blvd to 4950 S	CN185 CN355	54.5 102.1	20.9 - 120 37.7 - 86.1	Peak flow from the 10-year storm is greater than the capacity of the existing pipes.	Project
D51	Spring Clover Dr northwest to Germania Ave to the Jordan River	CN337 CN336	10.4 15.8	14.3 17.4 - 59.9	The City has noticed flooding on Spring Clover Dr.	Project
D52	Murray Parkway Golf Course along Winchester from 700 West to about 1040 West and then North West through the Golf Course to the Jordan River	CN551 CN548 CN306	27.9 27.9 28.5	54.1-68.8 49.5-55.76 93.4-105.8	The City has indicated that the pipes at this location are CMP pipes and are in need of replacement.	Project

CHAPTER 6 - CAPITAL IMPROVEMENT PLAN

PREFERRED DRAINAGE PLAN DEVELOPMENT

Meetings were held with Murray City personnel to identify and evaluate alternatives for storm drainage improvements. Selection of the preferred alternative for each problem was a process of evaluation and refinement, rather than a simple choice between alternatives. The process of selecting a preferred alternative included: reviewing the list of storm drainage inadequacies, brainstorming possible solutions to the problems, screening alternatives based on feasibility and public acceptance, development of alternatives, comparison based on cost and function, and selection of the preferred alternative.

The flows and pipe diameters provided in the capital improvement project descriptions are approximate and are for planning purposes only. A detailed hydrologic and hydraulic analysis should be performed during the design process for the master plan update improvement projects to identify final design pipe sizes.

PRECISION OF COST ESTIMATES

When considering cost estimates, there are several levels or degrees of precision depending on the purpose of the estimate and the percentage of detailed design that has been completed. The following levels of precision are typical:

Type of Estimate	Precision
Master Planning	±50%
Preliminary Design	±30%
Final Design or Bid	±10%

For example, at the master planning level (or conceptual or feasibility design level), if a project is estimated to cost $1,000,000, then the precision or reliability of the cost estimate would typically be expected to range between approximately $500,000 and $1,500,000. While this may seem very imprecise, the purpose of master planning is to develop general sizing, location, cost, and scheduling information on a number of individual projects that may be designed and constructed over a period of many years. Master planning also typically includes the selection of common design criteria to help ensure uniformity and compatibility among future individual projects. Details such as the exact capacity of individual projects, the level of redundancy, the location of facilities, the alignment and depth of pipelines, the extent of utility conflicts, the cost of land and easements, the construction methodology, the types of equipment and material to be used, the time of construction, interest and inflation rates, permitting requirements, etc., are typically developed during the more detailed levels of design.

At the preliminary or 10% design level, some of the aforementioned information will have been developed. Major design decisions such as the size of facilities, selection of facility sites, pipeline alignments and depths, and the selection of the types of equipment and material to be used during construction will typically have been made. At this level of design the precision of the cost estimate for a $1,000,000 project would typically be expected to range between approximately $700,000 and $1,300,000.

After the project has been completely designed and is ready to bid, all design plans and technical specifications will have been completed and nearly all of the significant details about

the project should be known. At this level of design, the precision of the cost estimate for the same $1,000,000 project would typically be expected to range between approximately $900,000 and $1,100,000. However, this level of precision can be greatly impacted by the bidding climate at the time of bid. If contractors are extremely busy, costs may be significantly higher. If contractors are not busy and want to keep their employees occupied, costs could be significantly less.

The pipe diameters provided in the following Capital Improvement Plan (CIP) descriptions are approximate and are for planning purposes only. A detailed hydrologic and hydraulic analysis should be performed during the design process of the projects to identify final design, sizing, and cost estimates.

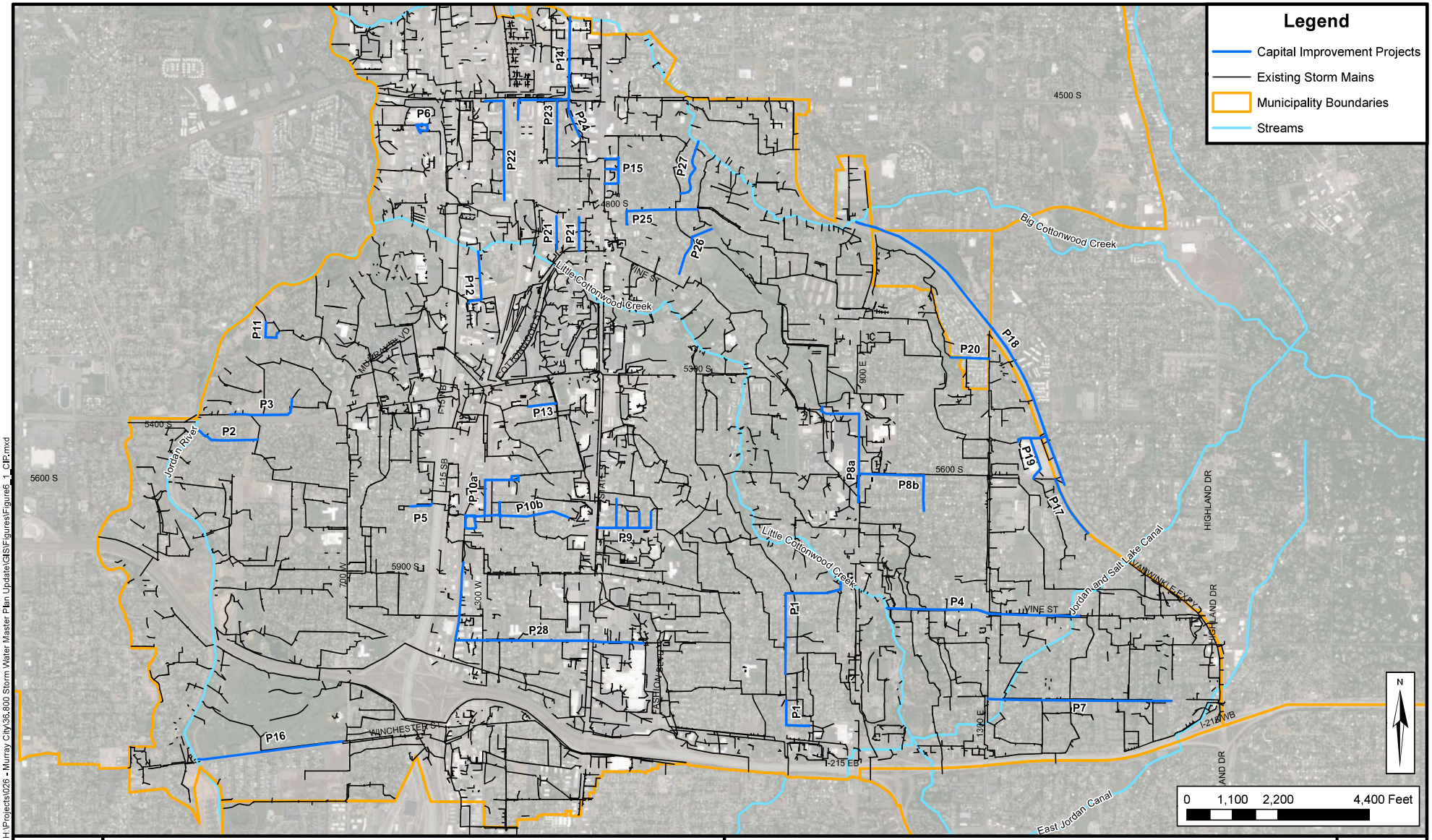
ESTIMATED CONSTRUCTION COSTS

Cost estimates are based on conceptual-level engineering. Unit construction costs were estimated based on communication with material suppliers, heavy construction data references (RSMeans, 2018), project costs from the previous master plan, construction cost indices from ENR (ENR, 2018), and contractor bids from other similar construction projects. Due to the current bid climate an additional 3.2% was implemented to represent cost increases from January to September. Cost estimates do not include costs associated with acquisition of right-of-way, legal fees, or administration. Engineering cost estimates given in this study should be regarded as conceptual and appropriate for use as a planning guide. Only during final design can a definitive and more accurate estimate be provided. A cost estimate of each alternative is provided in Appendix D.

CAPITAL IMPROVEMENT PLAN

Table 6-1 presents the recommended capital improvements which are shown on Figure 6-1. Alternative projects are shown on Figure 6-2. Projects from the previous Master Plan were reviewed and included in the CIP in cases where they had not already been addressed. Project IDs do not correspond with deficiency IDs, but deficiencies alleviated by the projects are also listed in Table 6-1.

The criteria for determining the priority of a project was based on if the City had noticed flooding, the extent of flooding, if the project was identified in the previous Master Plan, and the City's schedule for road improvement projects. Priority projects are listed under schedule A. The schedule for the CIP is divided into three time frames: projects to be completed within 5 years (A), projects to be completed between 5 and 10 years from 2018 (B), and projects to be completed beyond 10 years from 2017 (C). The City moved some projects up in the schedule to reflect implementation of projects with concurrent construction efforts or to address some frequent flooding deficiencies that impact residences.



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HANSEN ALLEN & LUCE INC ENGINEERS

Murray City
Storm Drainage Master Plan Update

Capital Improvement Plan

FIGURE 6-1

Table 6-1
Capital Improvement Plan

Project ID	Priority	Deficiency ID	Location	Preferred Solution	Total Cost
P1	A (0 to 5 years)	D13	Labrum Ave to 725 E, 725 E from Labrum Ave to 5900 S, and 5900 S from 725 E to Little Cottonwood Creek	Replace existing storm drain. The replacement conveyances are described below: • 24" diameter pipe in Labrum Ave (new pipe) • 24" diameter pipe in 725 E from Labrum Ave to 6410 S (new pipe) • 30" diameter pipe in 725 E from Southwood Dr to Holly Cir • 42" diameter pipe in 725 E from Holly Cir to 5900 S • 42" diameter pipe in 5900 S from 725 E to Little Cottonwood Creek	$2,227,000
P2	A (0 to 5 years)	D23, D49	Walden Meadows Dr from 950 W to the Jordan River	Construct new storm drain to intersect the existing storm drain crossing Walden Meadows Dr to the existing storm drain in Murray Parkway Ave to the outfall on the Jordan River. All flows from the existing storm drain will be diverted down the new storm drain. The new and replacement conveyances are described below: • 30" diameter pipe in Walden Meadows Dr from 950 W to Murray Parkway Ave • 36" diameter pipe along the existing storm drain alignment from Walden Meadows Dr and Murray Parkway Ave to outfall to the Jordan River. Include a water treatment structure	$628,000
P3	A (0 to 5 years)	D23, D49	Clover Meadow Dr to 5400 S and along 5400 S to 1020 W	Replace existing storm drain from the bottom of Clover Meadow Dr, between the homes, and to 5400 S, then along 5400 S to the existing 36" diameter storm drain at approximately 1020 W. This project would be an alternative to P12-A2 or P12-A3. The conveyances are described below: • 18" diameter pipe across the circle on Clover Meadow Drive, replacing existing pipe • 24" diameter pipe installed with trenchless construction through the residential property, replacing existing pipe • 30" diameter pipe installed along 5400 S past the apartments on New Hampton Dr • 30" diameter pipe installed along 5400 S to the existing 30" diameter storm drain at approximately 980 W • 36" diameter pipe installed along 5400 S to the existing 36" storm drain pipe along Bellwood Ln	$722,000
P4	A (0 to 5 years)	D45, D46	Vine Street from Rodeo Ln to Little Cottonwood Creek	Install new storm drain in Vine St from Rodeo Ln to an outfall on Little Cottonwood Creek. The new conveyances are described below: • 24" diameter pipe in Vine St from Rodeo Ln to 1300 E • 30" diameter pipe in Vine St from 1300 E to Lakeside Dr • 36" diameter pipe in Vine St from Lakeside Dr to an outfall in line with Vine St on Little Cottonwood Creek (Total Cost of the project is estimated at $1,848,000 but it is anticipated that Murray City will only be responsible for amount shown in total cost)	$500,000
P5	A (0 to 5 years)	D21	Anderson Ave from Sanford Dr to Green St	Replace storm drain along Anderson Ave from Sanford Dr to Green St. The new conveyances are described below: • 18" diameter pipe across Sanford Ave • 24" diameter pipe from Sanford Ave to Green St	$177,000
P6	A (0 to 5 years)	D37	Storage lot at the intersection of Cherry St and Jensen Ln	Construct a new detention basin and add storm drain to the area. The improvements are described below: • Construct 2 detention basins (Cherry Street and Jensen Lane & West of 500 West at Cherry Street) • 18" and 24" Diameter Pipe to direct flow in and out of Detention at Cherry and Jensen • 18" and 30" Diameter Pipe to direct flow from the pump station to existing piping across 500 West and from existing piping to the West Detention Basin.	$252,000
P7	B (5 to 10 years)	D2, D3	6400 S from 1865 E to 1300 E	Collect runoff along and south of 6400 S and connect to an existing line in 1300 E. The new conveyances are described below: • 18" diameter pipe from 1865 E to Rodeo Ln • 24" diameter pipe from Rodeo Ln to 1300 E	$1,292,000
P8a	B (5 to 10 years)	D11	900 E and Woodoak Ln from 5700 S to 820 E	Collect runoff tributary to irrigation line and convey it to 60" pipe in golf course. The conveyances are described below: • 30" diameter pipe in 900 E from 5700 S to 5600 S • 36" diameter pipe in 900 E and Woodoak from 5600 S to existing 60" golf course line	$1,563,000
P8b	B 5 to 10 years)	D11	5600 S and 1080 E from 5730 S to 900 E	Convey flow from east of the 1080 E and along 5600 S to project 6a in 900 E. The conveyances are described below: • 24" diameter pipe in 1080 E from 5730 S to 5600 S • 24" diameter pipe in 5600 S from 1080 E to 900 E	$769,000

Project ID	Priority	Deficiency ID	Location	Preferred Solution	Total Cost
P9	B (5 to 10 years)	D17	5770 S from Wood Cir to State St, Lindon St from Lindon Way to 5770 S, Wood Cir, Hansen Cir, and Butler Cir	Convey runoff from the downhill cul-de-sacs and Lindon Way to new storm drain in 5770 S and to the existing storm drain in State St. The new conveyances are described below: • 18" diameter pipe in Wood Cir, Hansen Cir, Butler Cir and Lindon St from Lindon Way to 5770 S • 24" diameter pipe in 5770 S from Wood Cir to State St	$875,000
P10a	B (5 to 10 years)	D18, D19, D20	From the south end of Riley Ln to 300 W, then south to approximately 5750 S	Construct a new detention basin at the south end of Riley Lane, install pipe across to 300 W, and then replace existing storm drain in 300 W to 5750 S and tie into project 10a. The new and replacement conveyances are described below: • Construct new detention basin at Riley Lane with approximately 0.7 ac-ft • 24" diameter pipe from Riley Lane along the property line and under the RR (boring) • 24" diameter pipe in 300 W from 5600 S to 5750 S (project P10a)	$661,000
P10b	B (5 to 10 years)	D18	5750 S from Nena Way to Utahna Dr	Convey runoff from the church on Stauffer Ln along 5750 S to Utahna Dr and tie into project 10a. The new conveyances are described below: • 18" diameter pipe in 5750 S from Nena Way to Utahna Dr	$442,000
P11	B (5 to 10 years)	D51	Northwest corner of Spring Clover Dr through the residential lots to the bottom of Germaine Ave	Install new storm drain in Spring Clover Dr, through the residential lots (trenchless construction), then north to the existing ditch at the bottom of Germaine Ave. The new conveyances are described below: • 18" diameter pipe in Spring Clover Dr for approximately 140 feet • 18" diameter pipe between 5194 S and 5204 S (trenchless construction) • 2' wide trapezoidal channel behind the residential parcels north to the ditch at the bottom of Germaine Ave	$339,000
P12	B (5 to 10 years)	D50	Vine St from 350 W to Commerce Dr and Commerce Dr from Vine St to the outfall to the Little Cottonwood Creek	Install new storm drain to intercept flow from the existing system at 350 W and Vine St, to Commerce Dr then north to Little Cottonwood Creek. Includes a water treatment structure. The new conveyances are described below: • 24" diameter pipe in Vine St from 350 W to Commerce Dr • 30" diameter pipe at the intersection of Commerce Dr and Vine St • 36" diameter pipe in Commerce Dr from Vine St to the outfall to Little Cottonwood Creek. This includes a water treatment structure	$718,000
P13	B (5 to 10 years)	D26	The southern leg of Woodrow St to Hillcrest Dr	Install new storm drain in the southern leg of Woodrow St to Hillcrest Dr. The new conveyance is described below: • 18" diameter pipe in Woodrow St to Hillcrest Dr	$174,000
P14	B (5 to 10 years)	D33, D34	Main St from 4500 S to Big Cottonwood Creek	Replace existing storm drain with larger conveyances. The replacement conveyances are described below: • 36" diameter pipe in Main St from 4500 S to Big Cottonwood Creek	$1,023,000
P15	B (5 to 10 years)	D33	Brown St from McHenry St to Rainbow Dr, Rainbow Dr, McHenry, and 4675 S from State St to Brown St	Replace and add storm drain to the area. The conveyances are described below: • 18" diameter pipe in Rainbow Dr, 4675 S, and McHenry St, from State St to Brown St • 24" diameter pipe in Brown St from McHenry St to Rainbow Dr	$446,000
P16	B (5 to 10 years)	D52	Murray Parkway Golf Course along Winchester from 700 West to about 1040 West and then North West through the Golf Course to the Jordan River	Replace Existing Aging Storm Drain CMP. The Coneyances are described below: • 48" diameter pipe down Winchester to the Jordan River • If the pipeline is moved from out of the golf course to Winchester, as is reflected in this cost estimate, drainage from the ponds in the golf course would have to be provided in addition. This is not included in the cost estimate listed.	$2,068,000
P17	C (beyond 10 years)	D5	West Side of Van Winkle from end of Fontaine Bleu to 5600 S	Convey the runoff collected at the end of Fontaine Bleu to existing storm drain in 5600 S. The improvements are described below: • 18" diameter pipe from approximately 5800 S to 5600 S	$321,000
P18	C (beyond 10 years)	D6, D7, D8, D9	East Side of Van Winkle from 5600 S to 900E	New conveyances to collect flow from east of Van Winkle and Murray City and connect to an existing county owned storm drain pipe near 900 E. The improvements are described below: • 36" diameter from 5600 S to 5550 S • 48" diameter from 5550 S to 5460 S • 60" diameter from 5460 S to 900 E	$5,981,000

Project ID	Priority	Deficiency ID	Location	Preferred Solution	Total Cost
P19	C (beyond 10 years)	D6, D7, D8, D9	From 5600 S through Gold's Gym parking lot and to project 3 at approximately 5465 S	Replace existing storm drain through the Gold's Gym parking lot and convey the flows with a new storm drain line to project 3a. The new and replacement conveyances are described below: • 42" diameter pipe from 5600 S through Gold's Gym parking lot • 48" diameter pipe from Gold's Gym parking lot across Van Winkle to project 3a	$1,096,000
P20	C (beyond 10 years)	D9	Pipe paralleling El Sendero from 1300 E to open channel	Replace existing storm drain paralleling El Sendero. The replacement conveyance is described below: • 48" diameter pipe paralleling El Sendero	$594,000
P21	C (beyond 10 years)	D29	Box Elder St and Alignment for the Downtown Redevelopment	Storm drainage for the area assuming 0.2 cfs/acre for new development should be implemented. The new conveyances are described below: • 18" diameter pipe in Box Elder St from approximately 4850 S to Vine St • 18" diameter pipe in new road parallel to Poplar St from approximately 4850 S to Vine St	$432,000
P22	C (beyond 10 years)	D35	200 W from 4800 S to 4500 Frontage Rd and 4500 Frontage Rd from 200 W to 260 W	Collect and convey runoff from 200 W with new storm drain. The conveyance is described below: • 24" diameter pipe in 200 W and 4500 Frontage	$964,000
P23	C (beyond 10 years)	D33, D34	4500 Frontage Rd from 160 W to Main St, 160 W from 4630 S to 4500 Frontage Rd and Box Elder St from Miller St to 4500 S	Add storm drain in order to prevent runoff from being collected in the existing irrigation line. To be completed in coordination with P20. The improvements are described below: • 18" diameter pipe in Box Elder St from Miller St to 4500 S • 36" diameter pipe in 4500 Frontage from 160 W to Main St	$1,434,000
P24	C (beyond 10 years)	D33, D34	Auto Blvd from 4600 S to 4500 S	Replace storm drain with larger storm drain. To be completed in coordination with P20. The conveyance is described below: • 30" diameter pipe in Auto Blvd from 4600 S to 4500 S	$382,000
P25	C (beyond 10 years)	D30	Center St from Division Ln to 4800 S and 4800 S from Center to Little Green	Replace existing storm drain with a larger pipe. The conveyances are described below: • 24" diameter pipe in Center St from Division Ln to 4800 S • 24" diameter pipe in 4800 S from Center St to Little Green	$663,000
P26	C (beyond 10 years)	D28	Glen St from 5000 S to Clark St intersection to Little Green	Collect and convey runoff from Glen St, Clark St, and Purcell Ct to Little Green. The conveyances are described below: • 18" diameter pipe in Glen St from 5000 S to Clark St • Open channel from Glen St and Clark St intersect to Little Green	$266,000
P27	C (beyond 10 years)	D31	Meadowview Rd, Meadoway St, and Meadow Rd to Big Cottonwood Creek	Collect and convey runoff from the Meadow Roads to the outlet. The conveyances are described below: • 18" diameter pipe in Meadowview Rd and Meadoway St • 24" diameter pipe in Meadow Rd to outlet	$418,000
P28	C (beyond 10 years)	D14	6100 S from just West of Fashion Boulevard to approximately 400 W, along the railroad tracks from 6100 S to 5850 S	Replace Existing Aging Storm Drain CMP. The Conveyances are described below: • 54" diameter pipe in 6100 South from just East of Fashion Boulevard to about 325 West (Includes a section of trenchless installation under Trax.) • 60" diameter pipe on 6100 South from about 325 East to about 400 East just East of the railroad and along the railroad from 6100 South to the detention basin just North of 5900 South.	$5,853,000
				TOTAL	**$33,280,000**

CAPITAL IMPROVEMENTS SUMMARY

Costs of the recommended projects organized by priority can be seen in Table 6-2.

Table 6-2
Summary of Capital Improvements by Schedule

Prioritization	Time Frame	Preferred Alternative A Total Cost
A	Within 5 years	$4,506,000
B	5-10 years	$10,370,000
C	Beyond 10 years	$18,404,000
	Total	**$33,280,000**

OPERATIONAL RECOMMENDATIONS

Inventory

This master plan used the City's inventory to account for the facilities of the storm drainage system. It is recommended that the City continue to maintain and update the master GIS inventory of the storm drainage system. Because the City storm drainage system is intertwined with UDOT facilities, efforts should be made to accurately include known UDOT facilities that City storm drainage flows into or flows from. Keeping track of pertinent UDOT facilities will allow the City to understand how UDOT pipes affect the City's system.

Watch and Maintenance Recommendations

In addition to the existing storm drainage system maintenance, it is recommended that deficiency D32 be addressed through frequent maintenance. A maintenance schedule for this deficiency could include removing debris, sediment, and clearing weed growth as needed to keep the drainage facilities functioning until corrective CIP projects can be completed, if justified.

Deficiencies identified as not warranting action include D1, D4, D7-D8, D10, D12, D14 (Although the City has determined no action is warranted due to capacity D14 is listed as a replacement project due to aging infrastructure), D15, D16, D22, D24-D25, D27, D32, D36, D38-D44, and D47-D48. These deficiencies should be monitored for future flooding. If conditions become unacceptable, a project should be added to the CIP to remedy the deficiency. Many of the watch deficiencies are facilities managed by the Utah Department of Transportation (UDOT) and would require coordination with UDOT for future remedies.

Storm Drainage Master Plan Updates

The storm drainage master plan should be periodically reviewed and updated dependent upon change and new development, at least every 5 years.

SUMMARY OF RECOMMENDATIONS

It is recommended that Murray City:

1. Review the new UPDES and anticipate potential changes to the Storm Water Management Plan to remain in compliance with the future permit.

2. Review the "Guide to Low Impact Development within Utah" and implement the LID suggestions into City Policy.

3. Maintain the current Storm Water Management Plan so it complies with the current effective UPDES permit.

4. Implement the Capital Improvement Plan presented in Chapter 6.

5. Continue to maintain the GIS storm drainage inventory.

6. Include deficiency D32 (Shamrock Dry Creek Crossing near 400 East) on the maintenance schedule.

7. Monitor the "Observe" deficiencies for future problems and address as needed.

8. Update or review the Storm Drainage Master Plan at least every 5 years.

9. Continue design review and inspection policies that will ensure City design and construction standards are achieved.

10. Continue to require new developments to reduce runoff to pre-construction levels.

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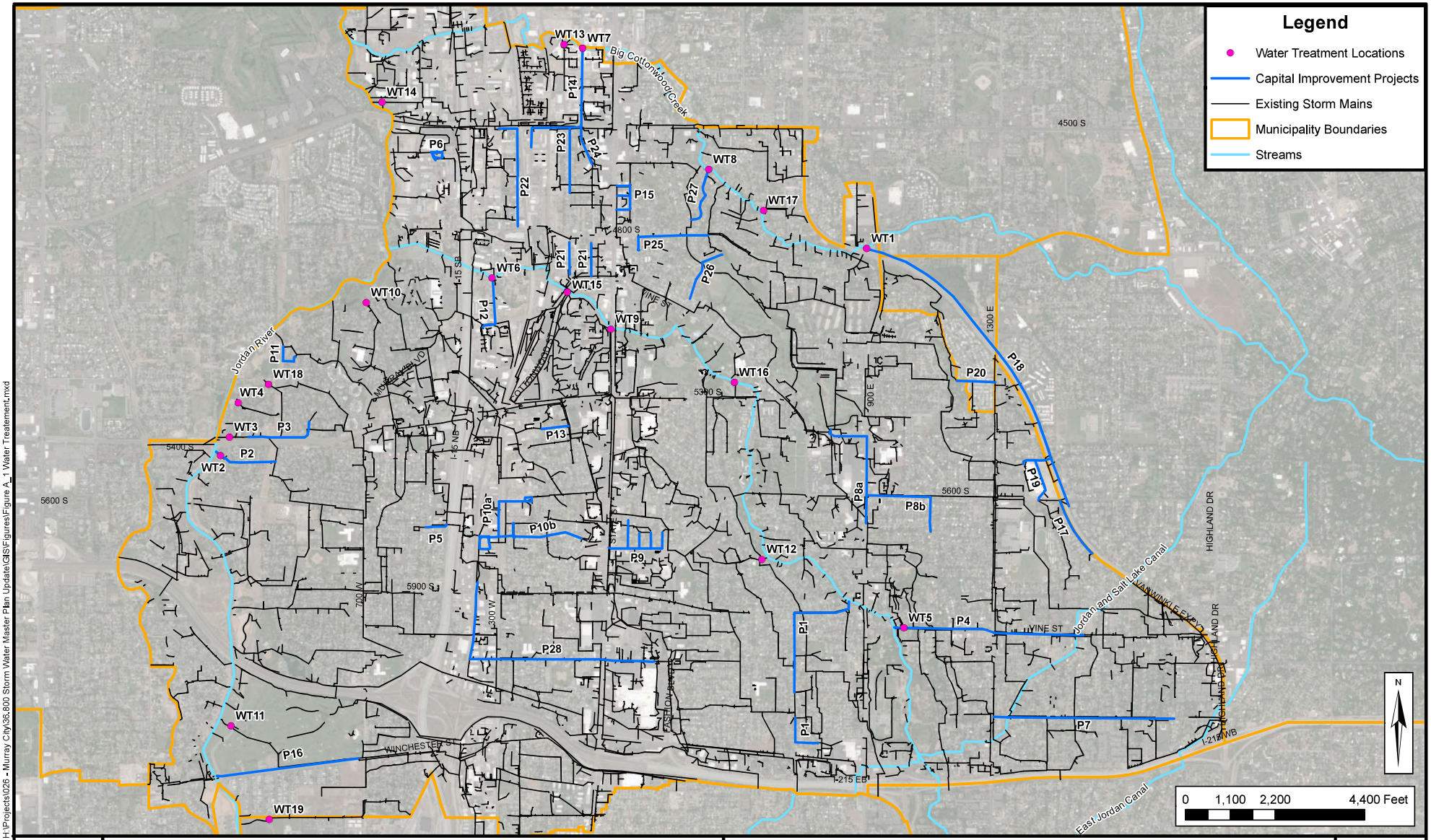
APPENDIX A

Suggested Water Treatment Locations

MURRAY CITY 2018 STORM DRAIN MASTER PLAN COSTS FOR WATER TREATMENT

1/17/2019
23.36.800

2018 ID	Associated Project in CIP	Pipe Dia	Length	Location	Road	PCost	MHCost	InCost	Additional Cost	Contingency	**Total Cost**	Project Cost
		ft	ft							30%		
WT1	P18	3	50	Vanwinkle Expressway at Big Cottonwood Creek	OUT	$14,289	$17,666	$0	$23,200	$16,547	**$71,702**	**$72,000**
WT2	P2	2.5	50	Walden Park at Jordan River	OUT	$11,640.06	$11,900	$0	$15,600	$11,742	**$50,882**	**$51,000**
WT3	P3	3	50	5400 South at Jordan River	OUT	$14,289	$17,666	$0	$23,200	$16,547	**$71,702**	**$72,000**
WT4		2	50	West of Halycon Drive at Jordan River	OUT	$8,852	$11,900	$0	$15,600	$10,906	**$47,257**	**$48,000**
WT5	P4	2.5	50	Vine Street at Little Cottonwood Creek	OUT	$11,640	$11,900	$0	$15,600	$11,742	**$50,882**	**$51,000**
WT6	P12	2.5	50	Commerce Drive at Little Cottonwood Creek	IN	$13,648	$11,900	$0	$15,600	$12,344	**$53,492**	**$54,000**
WT7	P14	2.5	50	Main Street at Big Cottonwood Creek	IN	$13,648	$11,900	$0	$15,600	$12,344	**$53,492**	**$54,000**
WT8	P27	2	50	Meadow Road at Big Cottonwood Creek	IN	$10,834	$8,150	$0	$15,600	$10,375	**$44,959**	**$45,000**
WT9		3	50	State Street at Little Cottonwood Creek	OUT	$14,289	$17,666	$0	$23,200	$16,547	**$71,702**	**$72,000**
WT10		3	50	End of 5115 South at Jordan River Parkway Trail	OUT	$14,289	$17,666	$0	$23,200	$16,547	**$71,702**	**$72,000**
WT11		3	50	Murray Parkway Golf Course at Jordan River	OUT	$14,289	$17,666	$0	$23,200	$16,547	**$71,702**	**$72,000**
WT12		2.5	50	Ridge Creek Circle at Little Cottonwood Creek	IN	$13,648	$11,900	$0	$15,600	$12,344	**$53,492**	**$54,000**
WT13		2.5	50	Burkhill Boulevard at Big Cottonwood Creek	OUT	$11,640	$11,900	$0	$15,600	$11,742	**$50,882**	**$51,000**
WT14		2.5	50	North of 4500 South at Jordan River	OUT	$11,640	$11,900	$0	$15,600	$11,742	**$50,882**	**$51,000**
WT15		2	50	Cottonwood Street at Little Cottonwood Creek	OUT	$8,852	$8,150	$0	$15,600	$9,781	**$42,382**	**$43,000**
WT16		2	50	Entrance to Murray City Amphetheater off 5300 South at Little Cottonwood Creek	OUT	$8,852	$8,150	$0	$15,600	$9,781	**$42,382**	**$43,000**
WT17		2	50	End of Duck Creek Circle at Big Cottonwood Creek	IN	$10,834	$8,150	$0	$15,600	$10,375	**$44,959**	**$45,000**
WT18		2	50	Germania Park	OUT	$8,852	$8,150	$0	$15,600	$9,781	**$42,382**	**$43,000**
WT19		2	50	6510 South at Jordan River	OUT	$8,852	$8,150	$0	$15,600	$9,781	**$42,382**	**$43,000**



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Murray City
Storm Drainage Master Plan Update

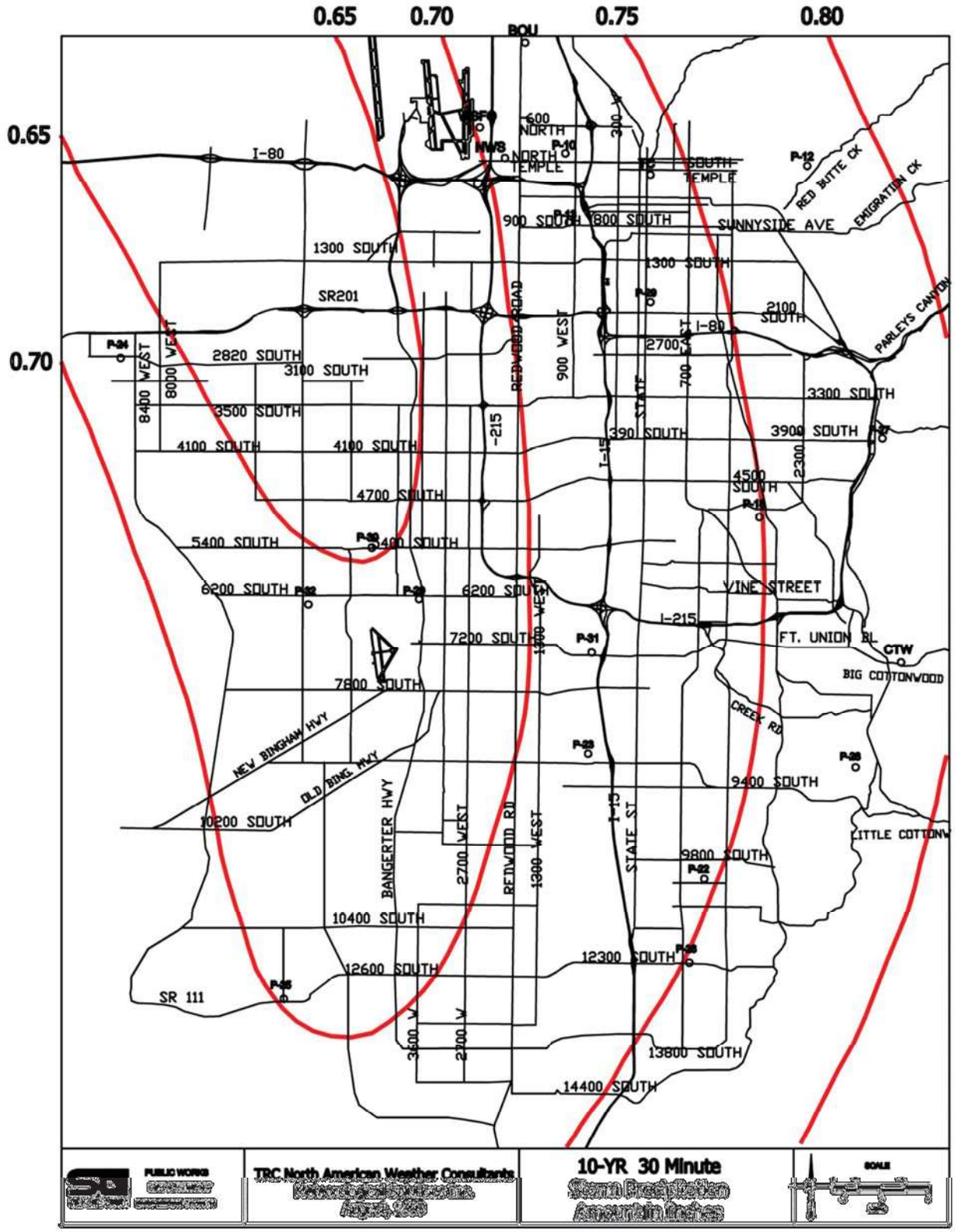
Capital Improvement Plan

FIGURE A-1

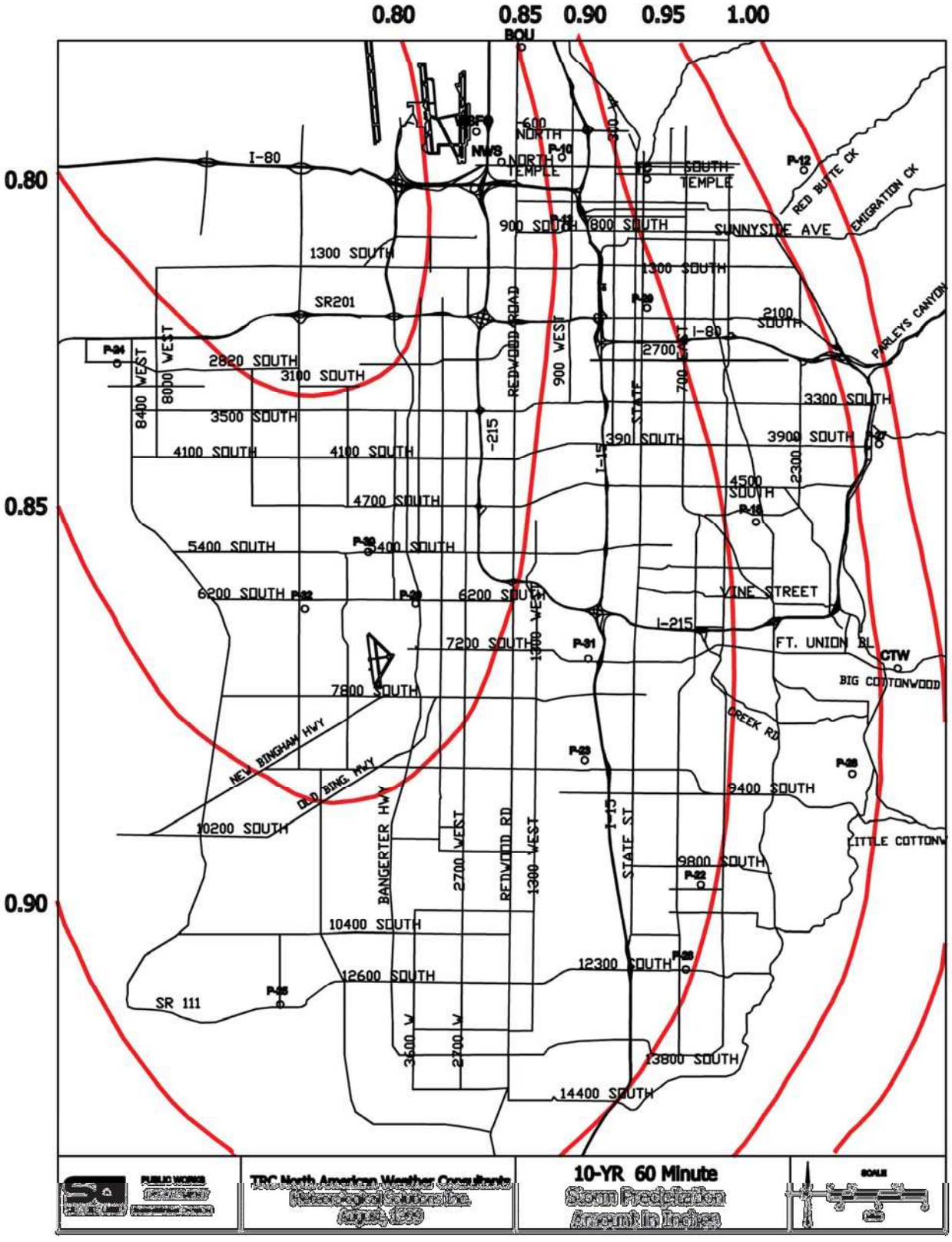
APPENDIX B

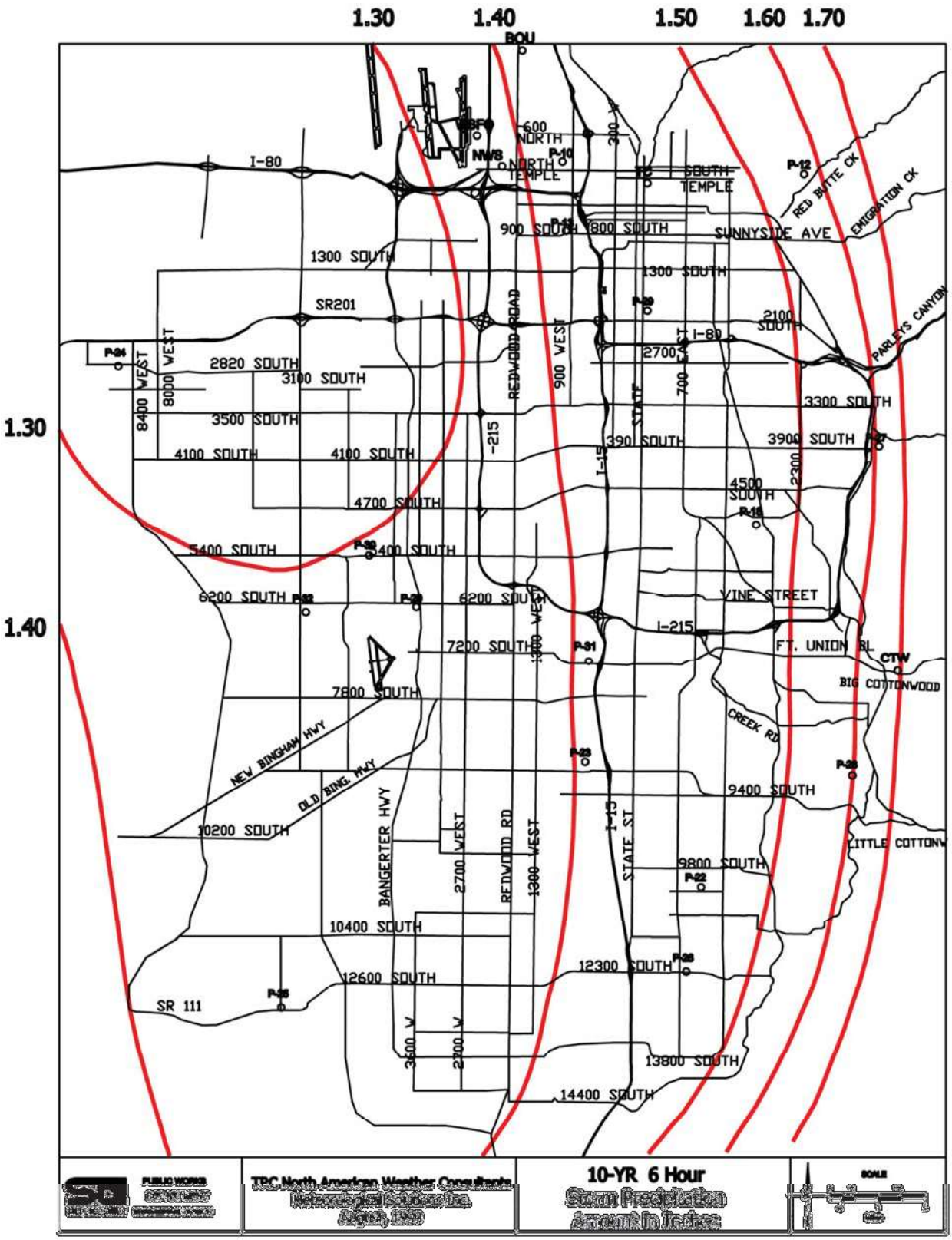
Hydrology Data

Precipitation Data 1/3



Precipitation Data 2/3

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SR 111
SUNNYSIDE AVE
2100 SOUTH
2700 SOUTH
3300 SOUTH
3900 SOUTH
4500 SOUTH
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FT. UNION BL
BIG COTTONWOOD
CREEK RD
LITTLE COTTONW
RED BUTTE CK
EMIGRATION CK
PARLEY'S CANYON
REDWOOD ROAD
900 WEST
1300 WEST
2700 WEST
8000 WEST
8400 WEST
STATE ST
I-15
I-215
2300 E
700 EAST
300 W
3600 W
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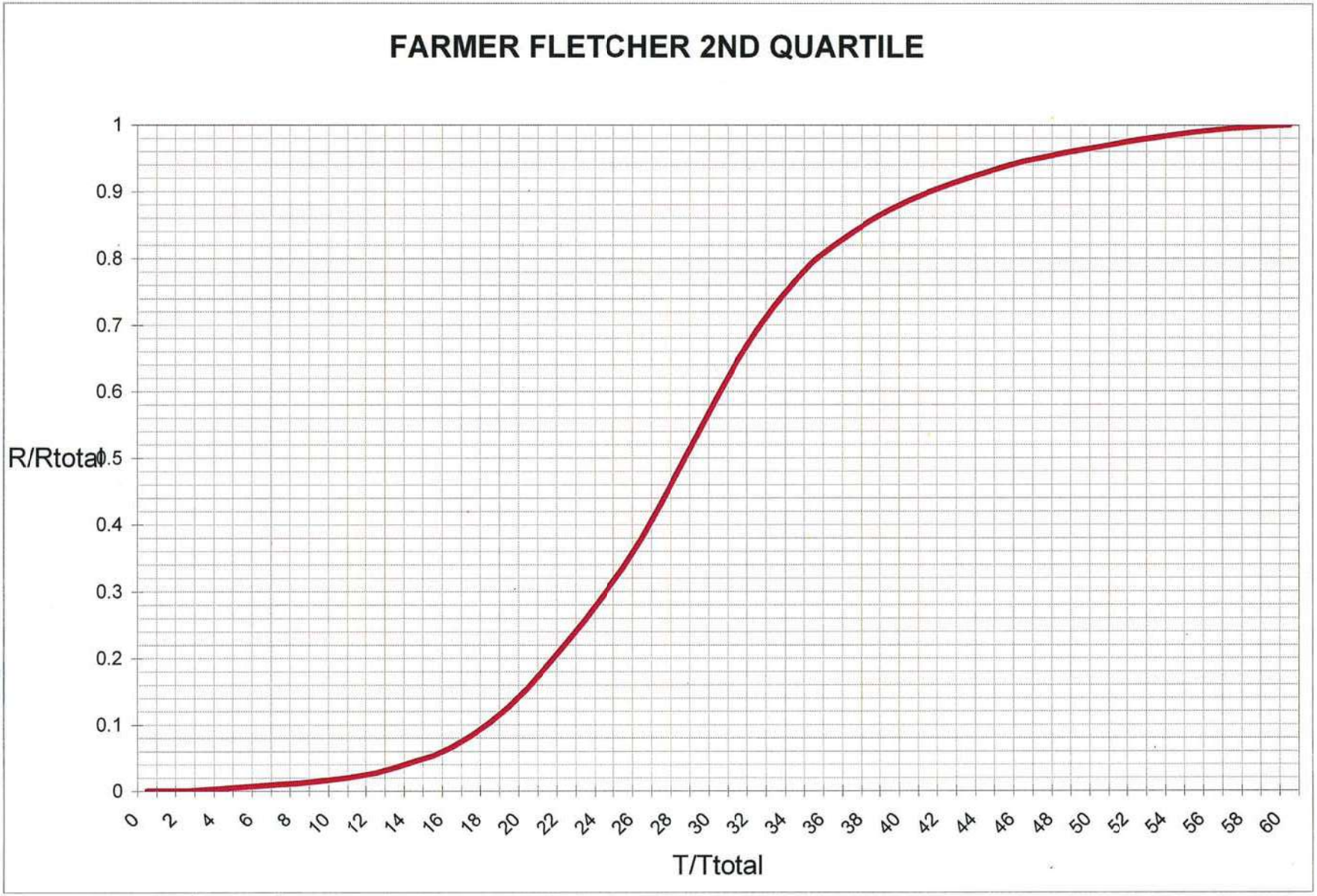
OLD BING. HWY
BANGERTER HWY
10-YR 6 Hour
Storm Precipitation
Amounts in Inches



Farmer Fletcher Distribution 1/1

Table 2-2a Runoff curve numbers for urban areas [1/]

Cover description		Curve numbers for hydrologic soil group			
Cover type and hydrologic condition	Average percent impervious area [2/]	A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.) [3/]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) [4/]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation) [5/]		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

[1] Average runoff condition, and $I_a = 0.2S$.

[2] The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

[3] CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

[4] Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

[5] Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

Table 2-2b Runoff curve numbers for cultivated agricultural lands [1]

Cover description			Curve numbers for hydrologic soil group			
Cover type	Treatment [2]	Hydrologic condition [3]	A	B	C	D
Fallow	Bare soil	—	77	86	91	94
	Crop residue cover (CR)	Poor	76	85	90	93
		Good	74	83	88	90
Row crops	Straight row (SR)	Poor	72	81	88	91
		Good	67	78	85	89
	SR + CR	Poor	71	80	87	90
		Good	64	75	82	85
	Contoured (C)	Poor	70	79	84	88
		Good	65	75	82	86
	C + CR	Poor	69	78	83	87
		Good	64	74	81	85
	Contoured & terraced (C&T)	Poor	66	74	80	82
		Good	62	71	78	81
	C&T+ CR	Poor	65	73	79	81
		Good	61	70	77	80
Small grain	SR	Poor	65	76	84	88
		Good	63	75	83	87
	SR + CR	Poor	64	75	83	86
		Good	60	72	80	84
	C	Poor	63	74	82	85
		Good	61	73	81	84
	C + CR	Poor	62	73	81	84
		Good	60	72	80	83
	C&T	Poor	61	72	79	82
		Good	59	70	78	81
	C&T+ CR	Poor	60	71	78	81
		Good	58	69	77	80
Close-seeded or broadcast legumes or rotation meadow	SR	Poor	66	77	85	89
		Good	58	72	81	85
	C	Poor	64	75	83	85
		Good	55	69	78	83
	C&T	Poor	63	73	80	83
		Good	51	67	76	80

[1] Average runoff condition, and I_a=0.2S

[2] Crop residue cover applies only if residue is on at least 5% of the surface throughout the year.

[3] Hydraulic condition is based on combination factors that affect infiltration and runoff, including (a) density and canopy of vegetative areas, (b) amount of year-round cover, (c) amount of grass or close-seeded legumes, (d) percent of residue cover on the land surface (good ≥ 20%), and (e) degree of surface roughness.

Poor: Factors impair infiltration and tend to increase runoff.

Good: Factors encourage average and better than average infiltration and tend to decrease runoff.

Table 2-2c Runoff curve numbers for other agricultural lands [1]

Cover description		Curve numbers for hydrologic soil group			
Cover type	Hydrologic condition	A	B	C	D
Pasture, grassland, or range—continuous forage for grazing. [2]	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Meadow—continuous grass, protected from grazing and generally mowed for hay.	—	30	58	71	78
Brush—brush-weed-grass mixture with brush the major element. [3]	Poor	48	67	77	83
	Fair	35	56	70	77
	Good	30 [4]	48	65	73
Woods—grass combination (orchard or tree farm). [5]	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
Woods. [6]	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	30 [4]	55	70	77
Farmsteads—buildings, lanes, driveways, and surrounding lots.	—	59	74	82	86

1 Average runoff condition, and $I_a = 0.2S$.

2 *Poor:* <50%) ground cover or heavily grazed with no mulch.
Fair: 50 to 75% ground cover and not heavily grazed.
Good: > 75% ground cover and lightly or only occasionally grazed.

3 *Poor:* <50% ground cover.
Fair: 50 to 75% ground cover.
Good: >75% ground cover.

4 Actual curve number is less than 30; use CN = 30 for runoff computations.

5 CN's shown were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CN's for woods and pasture.

6 *Poor:* Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.
Fair: Woods are grazed but not burned, and some forest litter covers the soil.
Good: Woods are protected from grazing, and litter and brush adequately cover the soil.

Table 2-2d Runoff curve numbers for arid and semiarid rangelands [1]

Cover description		Curve numbers for hydrologic soil group			
Cover type	Hydrologic condition [2]	A [3]	B	C	D
Herbaceous—mixture of grass, weeds, and low-growing brush, with brush the minor element.	Poor		80	87	93
	Fair		71	81	89
	Good		62	74	85
Oak-aspen—mountain brush mixture of oak brush, aspen, mountain mahogany, bitter brush, maple, and other brush.	Poor		66	74	79
	Fair		48	57	63
	Good		30	41	48
Pinyon-juniper—pinyon, juniper, or both; grass understory.	Poor		75	85	89
	Fair		58	73	80
	Good		41	61	71
Sagebrush with grass understory.	Poor		67	80	85
	Fair		51	63	70
	Good		35	47	55
Desert shrub—major plants include saltbush, greasewood, creosotebush, blackbrush, bursage, palo verde, mesquite, and cactus.	Poor	63	77	85	88
	Fair	55	72	81	86
	Good	49	68	79	84

1 Average runoff condition, and I_a = 0.2S. For range in humid regions, use table 2-2c.
2 Poor: <30% ground cover (litter, grass, and brush overstory).
Fair: 30 to 70% ground cover.
Good: > 70% ground cover.
3 Curve numbers for group A have been developed only for desert shrub.

Chapter 3 Time of Concentration and Travel Time

TR-55 5/8

Travel time (T_t) is the time it takes water to travel from one location to another in a watershed. T_t is a component of time of concentration (T_c), which is the time for runoff to travel from the hydraulically most distant point of the watershed to a point of interest within the watershed. T_c is computed by summing all the travel times for consecutive components of the drainage conveyance system.

T_c influences the shape and peak of the runoff hydrograph. Urbanization usually decreases T_c, thereby increasing the peak discharge. But T_c can be increased as a result of (a) ponding behind small or inadequate drainage systems, including storm drain inlets and road culverts, or (b) reduction of land slope through grading.

Factors affecting time of concentration and travel time

Surface roughness

One of the most significant effects of urban development on flow velocity is less retardance to flow. That is, undeveloped areas with very slow and shallow overland flow through vegetation become modified by urban development: the flow is then delivered to streets, gutters, and storm sewers that transport runoff downstream more rapidly. Travel time through the watershed is generally decreased.

Channel shape and flow patterns

In small non-urban watersheds, much of the travel time results from overland flow in upstream areas. Typically, urbanization reduces overland flow lengths by conveying storm runoff into a channel as soon as possible. Since channel designs have efficient hydraulic characteristics, runoff flow velocity increases and travel time decreases.

Slope

Slopes may be increased or decreased by urbanization, depending on the extent of site grading or the extent to which storm sewers and street ditches are used in the design of the water management system. Slope will tend to increase when channels are straightened and decrease when overland flow is directed through storm sewers, street gutters, and diversions.

Computation of travel time and time of concentration

Water moves through a watershed as sheet flow, shallow concentrated flow, open channel flow, or some combination of these. The type that occurs is a function of the conveyance system and is best determined by field inspection.

Travel time (T_t) is the ratio of flow length to flow velocity:

$$T_t = \frac{L}{3600V} \qquad \text{[eq. 3-1]}$$

where:

T_t = travel time (hr)
L = flow length (ft)
V = average velocity (ft/s)
3600 = conversion factor from seconds to hours.

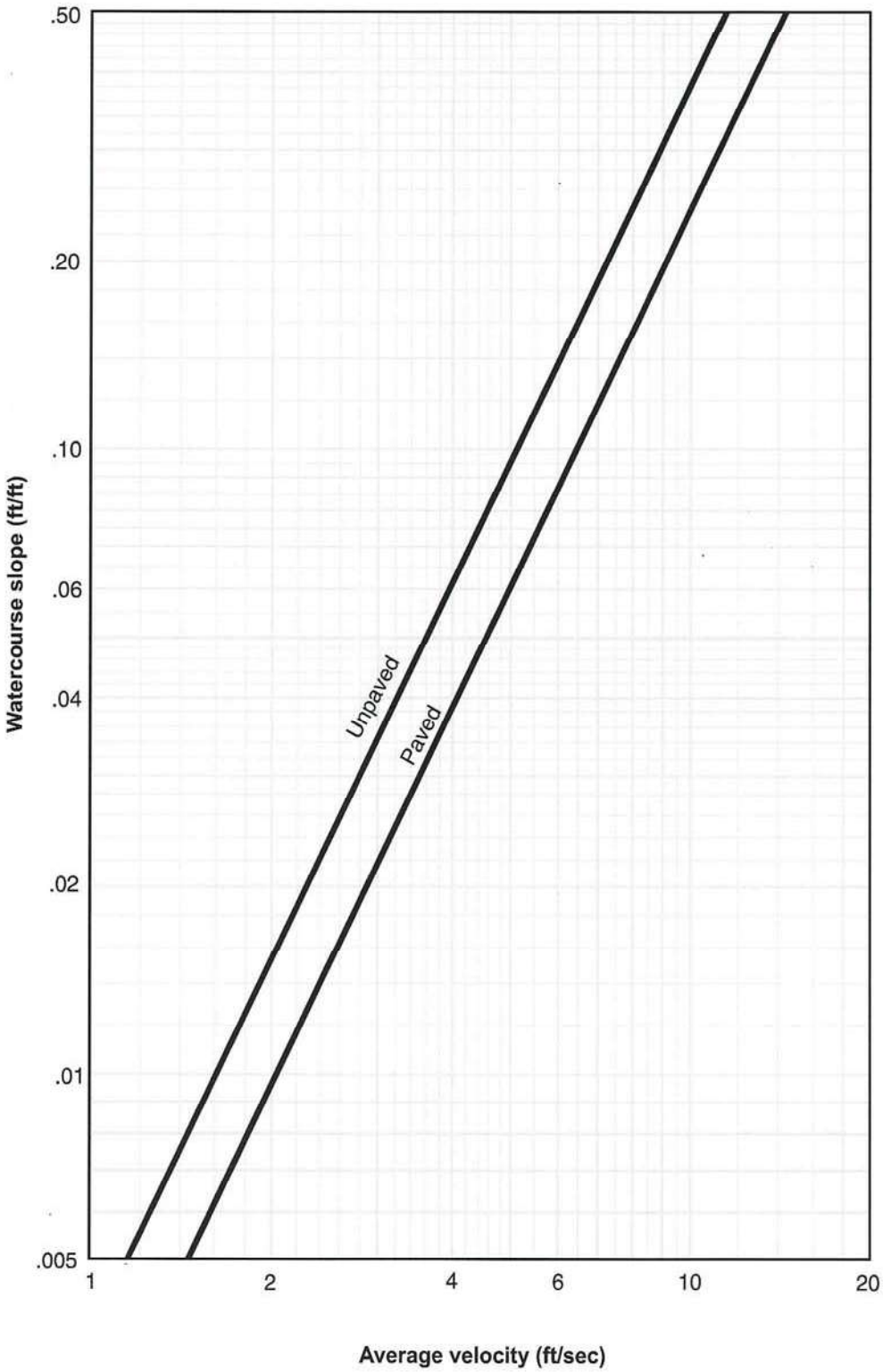
Time of concentration (T_c) is the sum of T_t values for the various consecutive flow segments:

$$T_c = T_{t_1} + T_{t_2} + \ldots T_{t_m} \qquad \text{[eq. 3-2]}$$

where:

T_c = time of concentration (hr)
m = number of flow segments

Figure 3-1 Average velocities for estimating travel time for shallow concentrated flow



Sheet flow

Sheet flow is flow over plane surfaces. It usually occurs in the headwater of streams. With sheet flow, the friction value (Manning's n) is an effective roughness coefficient that includes the effect of raindrop impact; drag over the plane surface; obstacles such as litter, crop ridges, and rocks; and erosion and transportation of sediment. These n values are for very shallow flow depths of about 0.1 foot or so. Table 3-1 gives Manning's n values for sheet flow for various surface conditions.

Table 3-1 Roughness coefficients (Manning's n) for sheet flow

Surface description	n [1]
Smooth surfaces (concrete, asphalt, gravel, or bare soil)	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover ≤20%	0.06
Residue cover >20%	0.17
Grass:	
Short grass prairie	0.15
Dense grasses [2]	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:[3]	
Light underbrush	0.40
Dense underbrush	0.80

[1] The n values are a composite of information compiled by Engman (1986).
[2] Includes species such as weeping lovegrass, bluegrass, buffalo grass, blue grama grass, and native grass mixtures.
[3] When selecting n , consider cover to a height of about 0.1 ft. This is the only part of the plant cover that will obstruct sheet flow.

For sheet flow of less than 300 feet, use Manning's kinematic solution (Overtop and Meadows 1976) to compute T_t:

$$T_t = \frac{0.007(nL)^{0.8}}{(P_2)^{0.5} s^{0.4}} \qquad \text{[eq. 3-3]}$$

where:

T_t = travel time (hr),
n = Manning's roughness coefficient (table 3-1)
L = flow length (ft)
P_2 = 2-year, 24-hour rainfall (in)
s = slope of hydraulic grade line (land slope, ft/ft)

This simplified form of the Manning's kinematic solution is based on the following: (1) shallow steady uniform flow, (2) constant intensity of rainfall excess (that part of a rain available for runoff), (3) rainfall duration of 24 hours, and (4) minor effect of infiltration on travel time. Rainfall depth can be obtained from appendix B.

Shallow concentrated flow

After a maximum of 300 feet, sheet flow usually becomes shallow concentrated flow. The average velocity for this flow can be determined from figure 3-1, in which average velocity is a function of watercourse slope and type of channel. For slopes less than 0.005 ft/ft, use equations given in appendix F for figure 3-1. Tillage can affect the direction of shallow concentrated flow. Flow may not always be directly down the watershed slope if tillage runs across the slope.

After determining average velocity in figure 3-1, use equation 3-1 to estimate travel time for the shallow concentrated flow segment.

Open channels

Open channels are assumed to begin where surveyed cross section information has been obtained, where channels are visible on aerial photographs, or where blue lines (indicating streams) appear on United States Geological Survey (USGS) quadrangle sheets. Manning's equation or water surface profile information can be used to estimate average flow velocity. Average flow velocity is usually determined for bankfull elevation.

Manning's equation is:

$$V = \frac{1.49 r^{\frac{2}{3}} s^{\frac{1}{2}}}{n} \qquad \text{[eq. 3-4]}$$

where:

V = average velocity (ft/s)
r = hydraulic radius (ft) and is equal to a/p_w
a = cross sectional flow area (ft^2)
p_w = wetted perimeter (ft)
s = slope of the hydraulic grade line (channel slope, ft/ft)
n = Manning's roughness coefficient for open channel flow.

Manning's n values for open channel flow can be obtained from standard textbooks such as Chow (1959) or Linsley et al. (1982). After average velocity is computed using equation 3-4, T_t for the channel segment can be estimated using equation 3-1.

Reservoirs or lakes

Sometimes it is necessary to estimate the velocity of flow through a reservoir or lake at the outlet of a watershed. This travel time is normally very small and can be assumed as zero.

Limitations

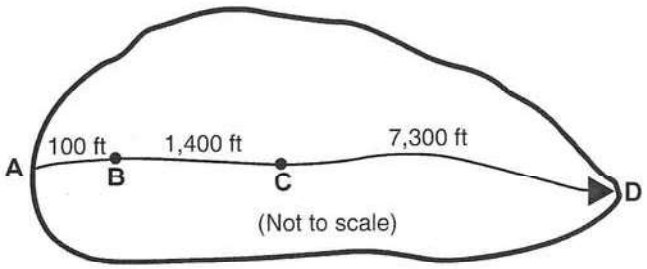
- Manning's kinematic solution should not be used for sheet flow longer than 300 feet. Equation 3-3 was developed for use with the four standard rainfall intensity-duration relationships.
- In watersheds with storm sewers, carefully identify the appropriate hydraulic flow path to estimate T_c. Storm sewers generally handle only a small portion of a large event. The rest of the peak flow travels by streets, lawns, and so on, to the outlet. Consult a standard hydraulics textbook to determine average velocity in pipes for either pressure or nonpressure flow.
- The minimum T_c used in TR-55 is 0.1 hour.
- A culvert or bridge can act as a reservoir outlet if there is significant storage behind it. The procedures in TR-55 can be used to determine the peak flow upstream of the culvert. Detailed storage routing procedures should be used to determine the outflow through the culvert.

Example 3-1

The sketch below shows a watershed in Dyer County, northwestern Tennessee. The problem is to compute T_c at the outlet of the watershed (point D). The 2-year 24-hour rainfall depth is 3.6 inches. All three types of flow occur from the hydraulically most distant point (A) to the point of interest (D). To compute T_c, first determine T_t for each segment from the following information:

Segment AB: Sheet flow; dense grass; slope (s) = 0.01 ft/ft; and length (L) = 100 ft. Segment BC: Shallow concentrated flow; unpaved; s = 0.01 ft/ft; and L = 1,400 ft. Segment CD: Channel flow; Manning's n = .05; flow area (a) = 27 ft^2; wetted perimeter (p_w) = 28.2 ft; s = 0.005 ft/ft; and L = 7,300 ft.

See figure 3-2 for the computations made on worksheet 3.



Murray City Storm Drain Master Plan
Subbasin Attributes
026.36.800
6-Nov-18

Subasin*	Area mi^2	Major Basin	Main Channel						Flow Planes: Length 1	Length 2	Slope 1	Slope 2	Roughness 1	Roughness 2	Area Imp. %	Area Perv. %	Curve # 1	Curve # 2
			Length	Slope	Shape	n	Dim1	Dim2										
SB1	0.0229	Central South	2250	0.017	Trapezoid	0.028	2	25	48	15	0.02	0.02	0.1	0.4	20	80	98	85
SB10	0.0067	Central South	856	0.012	Trapezoid	0.015	2	25	50	70	0.02	0.02	0.1	0.4	22	78	98	80
SB100	0.0234	Central East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	24	76	98	58
SB101	0.0190	Central East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	23	77	98	66
SB102	0.0097	Central East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	21	79	98	65
SB103	0.0143	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	27	73	98	52
SB104	0.0119	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	22	78	98	49
SB105	0.0158	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	22	78	98	48
SB106	0.0149	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	30	70	98	62
SB107	0.0106	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	21	79	98	63
SB107b	0.0054	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	21	79	98	63
SB108	0.0111	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	26	74	98	69
SB109	0.0382	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	5	95	98	80
SB11	0.0083	Central South	1400	0.026	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	16	84	98	67
SB110	0.0579	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	19	81	98	73
SB1101	0.0393	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	60	40	98	76
SB1102	0.0336	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	32	68	98	85
SB1103	0.0420	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	68	32	98	82
SB1104	0.0147	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	64	36	98	84
SB111	0.0197	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	13	87	98	75
SB112a	0.0086	Central	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	88	12	98	74
SB112b	0.0054	Central	1817	0.003	Trapezoid	0.015	2	25	35	10	0.02	0.02	0.1	0.4	92	8	98	74
SB112c	0.0022	Central	1817	0.003	Trapezoid	0.015	2	25	35	10	0.02	0.02	0.1	0.4	80	20	98	74
SB113	0.0271	Central	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	95	5	98	65
SB114	0.0168	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	45	55	98	80
SB115	0.0339	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	20	80	98	80
SB116	0.0297	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	5	95	98	80
SB117	0.0245	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	8	92	98	80
SB118	0.0366	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	15	85	98	80
SB119	0.0214	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	40	60	98	80
SB12	0.0140	Central South	1300	0.025	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	95	5	98	70
SB120	0.0184	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	55	45	98	80
SB1201	0.0355	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	75	25	98	80
SB1202	0.0216	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	47	53	98	79
SB1203	0.0350	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	55	45	98	82
SB1204	0.0227	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	46	54	98	76
SB1205	0.0493	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	39	61	98	81
SB121	0.0402	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	22	78	98	79
SB122	0.0172	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	40	60	98	89
SB124	0.0218	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	53	47	98	62
SB125	0.0153	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	6	94	98	84
SB126	0.0287	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	30	70	98	84
SB127	0.0031	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	30	70	98	84
SB128	0.0072	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	30	70	98	80
SB129	0.0208	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	15	85	98	80
SB13	0.0165	Central South	1400	0.01	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	95	5	98	79
SB130	0.0090	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	30	70	98	80
SB1301	0.0293	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	27	73	98	86
SB1302	0.0273	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	38	62	98	82
SB1303	0.0212	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	81	19	98	79
SB1304	0.0177	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	30	70	98	87
SB1305	0.0097	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	33	67	98	73
SB1306	0.0153	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	12	88	98	44
SB1307	0.0332	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	32	68	98	46
SB1308	0.0369	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	28	72	98	46
SB1309	0.0084	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	29	71	98	85
SB131	0.0175	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	21	79	98	84
SB1310	0.0119	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	38	62	98	74
SB1311	0.0095	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	65	35	98	39
SB132	0.0073	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	43	57	98	80
SB133a	0.0101	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	16	84	98	80
SB133b	0.0029	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	15	85	98	80
SB134	0.0185	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	30	70	98	74
SB135	0.0125	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	30	70	98	74
SB136	0.0143	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	11	89	98	75
SB137a	0.0174	Central	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	68	32	98	74
SB137b	0.0027	Central	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	67	33	98	74

Subasin*	Area mi^2	Major Basin	Main Channel						Length		Slope		Roughness		Area		Curve #	
			Length	Slope	Shape	n	Dim1	Dim2	1	2	1	2	1	2	Imp. %	Perv. %	1	2
SB138	0.0291	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	48	52	98	84
SB14	0.0149	Central South	470	0.0072	Trapezoid	0.025	2	25	50	15	0.02	0.02	0.1	0.4	95	5	98	86
SB140	0.0210	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	26	74	98	65
SB1401	0.0362	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	40	60	98	82
SB1402	0.0225	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	26	74	98	73
SB1403	0.0246	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	28	72	98	63
SB1404	0.0105	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	2	98	98	41
SB141	0.0279	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	2	98	98	62
SB142	0.0111	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	23	77	98	80
SB143	0.0064	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	17	83	98	79
SB144	0.0229	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	40	60	98	74
SB145	0.0101	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	90	10	98	74
SB146	0.0203	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	34	66	98	61
SB147	0.0163	North	1000	0.002	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	90	10	98	89
SB148	0.0098	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	32	68	98	61
SB149	0.0126	Central South	1600	0.0037	Trapezoid	0.025	2	25	35	70	0.02	0.02	0.1	0.4	30	70	98	74
SB15	0.0187	Central South	650	0.01	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	90	10	98	86
SB150	0.0188	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	27	73	98	68
SB1501	0.0126	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	31	69	98	62
SB1502	0.0277	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	31	69	98	51
SB1503	0.0444	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	23	77	98	54
SB1504	0.0158	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	19	81	98	51
SB1505	0.0401	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	21	79	98	52
SB1506	0.0196	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	26	74	98	54
SB1507	0.0457	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	20	80	98	50
SB1508	0.0235	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	38	62	98	47
SB1509	0.0388	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	36	64	98	43
SB151	0.0183	Central South	1500	0.019	Trapezoid	0.025	2	25	140	100	0.05	0.02	0.1	0.4	95	5	98	64
SB1510	0.0016	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	62	38	98	39
SB1511	0.0074	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	38	62	98	66
SB1512	0.0099	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	25	75	98	50
SB1513	0.0205	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	33	67	98	51
SB1514	0.0069	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	90	10	98	39
SB1515	0.0029	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	89	11	98	39
SB152	0.0224	Central South	1500	0.019	Trapezoid	0.025	2	25	140	100	0.05	0.02	0.1	0.4	95	5	98	64
SB153	0.0227	Central South	1077	0.006	Trapezoid	0.025	2	25	35	70	0.02	0.02	0.1	0.4	75	25	98	74
SB154	0.0205	Central South	1800	0.005	Circle	0.015	2		35	100	0.02	0.02	0.1	0.4	30	70	98	74
SB155	0.0122	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	35	65	98	65
SB156	0.0164	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	85	15	98	62
SB157	0.0065	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	36	64	98	64
SB158	0.0141	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	77	23	98	89
SB159	0.0200	Central South	1100	0.0025	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	85	15	98	88
SB16	0.0152	Central South	1245	0.008	Trapezoid	0.015	2	25	250	20	0.02	0.02	0.1	0.4	90	10	98	84
SB160	0.0064	Central	1600	0.013	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.025	39	61	98	79
SB1601	0.0050	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	19	81	98	85
SB1602	0.0048	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	17	83	98	52
SB1603	0.0369	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	29	71	98	64
SB1604	0.0132	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	19	81	98	51
SB1605	0.0184	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	41	59	98	73
SB1606	0.0122	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	63	37	98	39
SB1607	0.0131	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	62	38	98	39
SB1608	0.0165	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	75	25	98	39
SB1609	0.0189	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	27	73	98	60
SB161	0.0186	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	30	70	98	80
SB1610	0.0085	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	70	30	98	39
SB162	0.0124	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	10	90	98	84
SB163	0.0381	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	64	36	98	86
SB164	0.0109	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	58	42	98	80
SB165	0.0112	Central West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	40	60	98	77
SB167	0.0080	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	45	55	98	70
SB169	0.0163	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	22	78	98	71
SB17	0.0100	Central South	500	0.007	Trapezoid	0.025	2	25	48	15	0.02	0.02	0.1	0.4	99	1	98	80
SB170	0.0143	Central South	500	0.007	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	15	85	98	70
SB1701	0.0500	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	27	73	98	50
SB1702	0.0170	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	26	74	98	47
SB1703	0.0092	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	26	74	98	47
SB171	0.0208	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	21	79	98	82
SB172	0.0113	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	25	75	98	68
SB173	0.0224	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	2	98	98	84
SB174	0.0172	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	65	35	98	65
SB175	0.0150	Central South	10024	0.012	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	60	40	98	64
SB176	0.0156	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	23	77	98	72

Subasin*	Area mi^2	Major Basin	Main Channel						Length		Slope		Roughness		Area		Curve #	
			Length	Slope	Shape	n	Dim1	Dim2	1	2	1	2	1	2	Imp. %	Perv. %	1	2
SB177	0.0080	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	35	65	98	76
SB18	0.0112	Central South	340	0.011	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	45	55	98	76
SB180	0.0149	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	29	71	98	70
SB181	0.0146	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	26	74	98	79
SB182	0.0062	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	27	73	98	79
SB183	0.0236	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	28	72	98	62
SB184	0.0087	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	31	69	98	72
SB185	0.0087	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	30	70	98	70
SB186	0.0096	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	25	75	98	70
SB187	0.0096	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	28	72	98	61
SB188	0.0124	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	40	60	98	62
SB19	0.0202	Central South	1170	0.017	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	18	82	98	67
SB190	0.0213	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	23	77	98	56
SB191	0.0167	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	22	78	98	54
SB192	0.0104	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	25	75	98	45
SB193a	0.0120	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	26	74	98	80
SB193b	0.0014	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	26	74	98	80
SB194	0.0116	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	24	76	98	67
SB195	0.0182	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	10	90	98	65
SB196	0.0105	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	22	78	98	69
SB198	0.0132	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	26	74	98	71
SB199	0.0236	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	20	80	98	63
SB2	0.0103	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	26	74	98	77
SB20	0.0155	Central South	850	0.005	Trapezoid	0.015	2	25	35	100	0.02	0.01	0.1	0.4	18	82	98	74
SB200	0.0164	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	35	65	98	62
SB201	0.0246	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	24	76	98	80
SB202	0.0120	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	17	83	98	80
SB203	0.0226	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	21	79	98	84
SB204	0.0340	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	16	84	98	55
SB205	0.0290	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	10	90	98	73
SB206	0.0092	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	10	90	98	62
SB207	0.0125	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	16	84	98	84
SB208	0.0122	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	5	95	98	75
SB209	0.0041	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	77	23	98	62
SB21	0.0102	Central South	870	0.005	Circle	0.015	2		35	70	0.02	0.02	0.1	0.4	28	72	98	74
SB2101	0.0209	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	57	43	98	83
SB2102	0.0143	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	20	80	98	85
SB2103	0.0236	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	24	76	98	86
SB2104	0.0424	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	40	60	98	85
SB2105	0.0287	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	21	79	98	84
SB2106	0.0051	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	26	74	98	85
SB22	0.0113	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	24	76	98	65
SB225	0.0184	North West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.2	0.2	0.1	0.4	2	98	98	79
SB226	0.0044	North West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.2	0.2	0.1	0.4	5	95	98	80
SB227	0.0178	North West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.2	0.2	0.1	0.4	14	86	98	78
SB228	0.0226	North West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.2	0.2	0.1	0.4	20	80	98	73
SB229	0.0076	North West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.2	0.2	0.1	0.4	11	89	98	75
SB23	0.0130	Central South	1000	0.02	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	38	62	98	64
SB231	0.0152	North West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.2	0.2	0.1	0.4	24	76	98	78
SB232	0.0199	North West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.2	0.2	0.1	0.4	23	77	98	77
SB233	0.0058	North West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.2	0.2	0.1	0.4	11	89	98	74
SB234	0.0113	North West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.2	0.2	0.1	0.4	7	93	98	80
SB235	0.0204	North West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.2	0.2	0.1	0.4	21	79	98	80
SB24	0.0191	Central South	520	0.005	Trapezoid	0.025	2	25	100	40	0.02	0.02	0.1	0.4	60	40	98	86
SB25	0.0086	Central South	850	0.005	Trapezoid	0.015	2	25	35	70	0.02	0.02	0.1	0.4	30	70	98	74
SB259	0.0142	Central South	700	0.007	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	70	30	98	70
SB26	0.0196	Central South	520	0.0038	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	90	10	98	78
SB260	0.0065	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	90	10	98	63
SB261	0.0465	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	25	75	98	80
SB262	0.0302	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	21	79	98	80
SB27	0.0171	Central South	1220	0.02	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	68	32	98	60
SB276	0.0222	Central	1220	0.02	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	32	68	98	60
SB277	0.0208	Central South	300	0.01	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	90	10	98	76
SB278	0.0088	Central	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	90	10	98	63
SB28	0.0142	Central South	1170	0.012	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	38	62	98	73
SB280	0.0127	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	17	83	98	66
SB281a	0.0127	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	92	8	98	89
SB281b	0.0019	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	97	3	98	89
SB282	0.0475	North	2500	0.003	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	75	25	98	78
SB283	0.0051	Central	570	0.007	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	11	89	98	77
SB284	0.0494	Central	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	95	5	98	66
SB285	0.0126	Central	1400	0.01	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	34	66	98	79

Subasin*	Area mi^2	Major Basin	Main Channel						Length		Slope		Roughness		Area		Curve #	
			Length	Slope	Shape	n	Dim1	Dim2	1	2	1	2	1	2	Imp. %	Perv. %	1	2
SB29	0.0043	Central South	1200	0.0092	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	22	78	98	69
SB3	0.0155	Central South	1768	0.01	Trapezoid	0.015	2	25	50	70	0.02	0.02	0.1	0.4	21	79	98	78
SB30	0.0076	Central South	1170	0.0075	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	23	77	98	69
SB31a	0.0134	Central South	1500	0.0013	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	89	11	98	89
SB31b	0.0084	Central South	1500	0.0013	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	90	10	98	89
SB3101	0.0277	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	19	81	98	84
SB3102	0.0141	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	26	74	98	89
SB3103	0.0096	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	85	15	98	68
SB3104	0.0305	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	84	16	98	86
SB3105	0.0342	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	91	9	98	89
SB315	0.0148	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	10	90	98	68
SB316	0.0213	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	35	65	98	76
SB32	0.0215	Central South	2600	0.005	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	36	64	98	69
SB3201	0.0209	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	22	78	98	89
SB3202	0.0189	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	73	27	98	89
SB3203	0.0092	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	73	27	98	89
SB3204	0.0081	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	85	15	98	88
SB3205	0.0182	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	89	11	98	87
SB3206	0.0255	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	90	10	98	85
SB325	0.0385	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	2	98	98	80
SB328a	0.0126	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	33	67	98	74
SB328b	0.0017	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	50	50	98	74
SB33	0.0119	Central South	1713	0.0041	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	36	64	98	74
SB337	0.0016	Central	650	0.01	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	34	66	98	86
SB338	0.0281	Central West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	14	86	98	77
SB339	0.0183	Central South	1713	0.004	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	75	25	98	70
SB340	0.0178	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	24	76	98	65
SB341	0.0066	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	19	81	98	68
SB342	0.0096	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	19	81	98	66
SB343	0.0031	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	40	60	98	70
SB344	0.0208	Central South	1000	0.01	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	80	20	98	74
SB345	0.0213	Central South	1000	0.01	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	32	68	98	70
SB346	0.0034	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	29	71	98	68
SB347	0.0229	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	11	89	98	66
SB348	0.0115	Central South	1000	0.01	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	26	74	98	70
SB349	0.0591	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	26	74	98	72
SB352	0.0117	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	21	79	98	69
SB353	0.0173	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	22	78	98	65
SB354	0.0241	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	24	76	98	52
SB355	0.0168	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	28	72	98	59
SB356	0.0108	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	26	74	98	69
SB357	0.0227	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	26	74	98	70
SB358	0.0275	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	21	79	98	66
SB359	0.0210	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	24	76	98	67
SB360	0.0458	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	26	74	98	73
SB361	0.0243	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	40	60	98	55
SB363	0.0275	Central West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	75	25	98	73
SB364	0.0118	Central West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	17	83	98	74
SB367	0.0198	Central	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	17	83	98	65
SB368	0.0241	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	50	50	98	43
SB369	0.0221	Central South	1030	0.01	Trapezoid	0.015	2	25	50	70	0.02	0.02	0.1	0.4	22	78	98	74
SB37	0.0167	Central South	1072	0.005	Trapezoid	0.015	2	25	35	70	0.02	0.02	0.1	0.4	25	75	98	74
SB370	0.0134	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	24	76	98	48
SB372	0.0225	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	3	97	98	80
SB375	0.0647	North West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.2	0.2	0.1	0.4	1	99	98	80
SB376	0.0141	North West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.2	0.2	0.1	0.4	20	80	98	76
SB379	0.0259	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	24	76	98	78
SB38	0.0196	Central South	1175	0.005	Circle	0.015	2		35	100	0.02	0.02	0.1	0.4	28	72	98	74
SB380	0.0166	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	3	97	98	67
SB381	0.0254	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	13	87	98	80
SB382	0.0268	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	15	85	98	80
SB383	0.0130	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	95	5	98	80
SB384	0.0063	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	21	79	98	65
SB387	0.0108	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	23	77	98	84
SB389	0.0179	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	20	80	98	76
SB39	0.0149	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	70	30	98	64
SB390	0.0193	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	33	67	98	63
SB391	0.0129	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	20	80	98	78
SB392	0.0217	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	19	81	98	80
SB393	0.0232	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	15	85	98	77
SB394	0.0103	Central	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	20	80	98	74
SB394b	0.0100	Central	1817	0.003	Trapezoid	1.015	2	25	35	100	0.02	0.02	0.1	4	22	78	98	74

Subasin*	Area mi^2	Major Basin	Main Channel						Length		Slope		Roughness		Area		Curve #	
			Length	Slope	Shape	n	Dim1	Dim2	1	2	1	2	1	2	Imp. %	Perv. %	1	2
SB395	0.0211	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	24	76	98	49
SB4	0.0150	Central South	375	0.002	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	28	72	98	77
SB40a	0.0161	Central South	1220	0.005	Circle	0.015	2		60	30	0.02	0.02	0.1	0.4	65	35	98	74
SB40b	0.0050	Central South	1220	0.005	Circle	0.015	2		60	30	0.02	0.02	0.1	0.4	62	38	98	74
SB400	0.0271	South	1600	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	26	74	98	65
SB402	0.0159	South	1400	0.006	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	69	31	98	61
SB407	0.0198	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	19	81	98	69
SB408	0.0273	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	90	10	98	64
SB409	0.0170	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	78	22	98	71
SB41	0.0183	Central South	1100	0.006	Circle	0.015	2		35	100	0.02	0.02	0.1	0.4	28	72	98	61
SB412	0.0297	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	76	24	98	73
SB413	0.0166	Central West	750	0.005	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	50	50	98	74
SB414	0.0134	Central West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	95	5	98	89
SB415	0.0260	Central West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	74	26	98	60
SB416	0.0302	Central West	1000	0.003	Trapezoid	0.025	2	25	35	40	0.02	0.02	0.1	0.4	55	45	98	63
SB417	0.0133	Central West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	95	5	98	64
SB418	0.0183	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	81	19	98	62
SB419	0.0070	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	95	5	98	89
SB42	0.0125	Central South	1160	0.006	Circle	0.015	2		20	100	0.01	0.02	0.1	0.4	35	65	98	61
SB420	0.0252	North	1400	0.003	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	50	50	98	89
SB421	0.0261	North	2500	0.013	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	85	15	98	66
SB422	0.0646	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	23	77	98	62
SB424	0.0276	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	24	76	98	49
SB425	0.0179	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	20	80	98	47
SB427	0.0148	Central East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	20	80	98	61
SB428	0.0455	Central East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	17	83	98	54
SB429	0.0234	Central East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	24	76	98	62
SB43	0.0129	Central South	720	0.005	Trapezoid	0.015	2	25	35	100	0.02	0.01	0.1	0.4	5	95	98	74
SB430	0.0273	Central	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	22	78	98	58
SB431	0.0606	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	20	80	98	72
SB432	0.0576	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	15	85	98	77
SB433	0.0374	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	23	77	98	66
SB434	0.0347	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	21	79	98	61
SB436	0.0253	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	90	10	98	58
SB44	0.0191	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	34	66	98	65
SB444	0.0945	Central South	2100	0.006	Trapezoid	0.025	2	25	50	250	0.02	0.02	0.1	0.4	56	44	98	75
SB444b	0.0242	Central South	2100	0.006	Trapezoid	0.025	2	25	50	250	0.02	0.02	0.1	0.4	82	18	98	75
SB45	0.0150	Central South	1572	0.005	Trapezoid	0.05	2	25	35	70	0.02	0.02	0.1	0.4	23	77	98	74
SB46	0.0211	Central South	350	0.002	Trapezoid	0.015	2	25	50	25	0.02	0.02	0.1	0.4	78	22	98	74
SB462	0.0271	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	22	78	98	66
SB463	0.0031	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	15	85	98	69
SB464	0.0202	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	19	81	98	58
SB466	0.0315	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	3	97	98	61
SB467	0.0267	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	26	74	98	67
SB468	0.0210	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	10	90	98	55
SB469	0.0162	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	25	75	98	51
SB47	0.0210	Central South	1200	0.003	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	33	67	98	62
SB470	0.0068	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	10	90	98	80
SB471	0.0152	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	20	80	98	76
SB472	0.0255	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	20	80	98	71
SB473	0.0288	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	28	72	98	76
SB475	0.0188	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	25	75	98	73
SB478	0.0185	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	23	77	98	78
SB479	0.0085	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	85	15	98	68
SB48	0.0167	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	22	78	98	62
SB480	0.0359	Central West	1817	0.003	Trapezoid	0.015	2	25	35	15	0.02	0.02	0.1	0.4	75	25	98	69
SB481	0.0044	Central	1120	0.0067	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	22	78	98	80
SB482	0.0073	Central	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	90	10	98	76
SB483	0.0096	Central West	375	0.002	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	43	57	98	77
SB484	0.0061	Central West	1510	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	24	76	98	64
SB485	0.0056	South East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	40	60	98	71
SB486	0.0514	Central East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	28	72	98	54
SB487	0.0191	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	27	73	98	76
SB488a	0.0915	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	24	76	98	74
SB488b	0.0296	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	24	76	98	74
SB49	0.0219	Central South	1540	0.003	Trapezoid	0.015	2	25	50	70	0.02	0.02	0.1	0.4	60	40	98	77
SB490	0.0265	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	70	30	98	63
SB493a	0.0129	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	38	62	98	84
SB493b	0.0095	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	15	85	98	84
SB494a	0.0038	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	15	85	98	83
SB494b	0.0037	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	10	90	98	83
SB496	0.0237	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	4	96	98	62

Subasin*	Area mi^2	Major Basin	Main Channel						Length		Slope		Roughness		Area		Curve #	
			Length	Slope	Shape	n	Dim1	Dim2	1	2	1	2	1	2	Imp. %	Perv. %	1	2
SB497	0.0414	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	17	83	98	84
SB498	0.0107	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	16	84	98	65
SB499	0.0067	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	22	78	98	63
SB5	0.0189	Central South	400	0.01	Trapezoid	0.025	2	25	100	100	0.02	0.02	0.1	0.4	27	73	98	80
SB50	0.0162	Central South	1360	0.011	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	38	62	98	85
SB500	0.0196	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	5	95	98	61
SB501	0.0105	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	34	66	98	68
SB502a	0.1061	Central South	2000	0.01	Circle	0.013	3		50	70	0.01	0.02	0.01	0.4	30	70	98	75
SB502b	0.0270	Central Sotuh	2000	0.01	Circle	0.013	3		50	70	0.01	0.02	0.01	0.4	30	70	98	75
SB502c	0.0431	Central South	2000	1.01	Circle	0.013	3		50	70	0.01	0.02	0.01	0.4	30	70	98	75
SB507	0.0133	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	26	74	98	72
SB508	0.0082	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	30	70	98	76
SB509	0.0187	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	2	98	98	67
SB51	0.0194	Central South	1170	0.005	Circle	0.015	2		50	30	0.02	0.02	0.1	0.4	75	25	98	78
SB510	0.0212	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	25	75	98	63
SB511	0.0124	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	14	86	98	76
SB512	0.0055	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	31	69	98	64
SB513	0.0219	West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	24	76	98	71
SB514	0.0201	Central South	1170	0.005	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	5	95	98	70
SB515	0.0244	Central South	1170	0.005	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	28	72	98	70
SB516	0.0600	Central South	1200	0.005	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	85	15	98	68
SB517	0.0220	Central West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	24	76	98	68
SB518	0.0190	Central West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	38	62	98	67
SB519	0.0261	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	25	75	98	61
SB52	0.0059	Central South	1000	0.008	Trapezoid	0.015	2	25	100	100	0.01	0.01	0.1	0.4	35	65	98	80
SB520	0.0045	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	45	55	98	84
SB521	0.0051	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	33	67	98	62
SB522	0.0198	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	22	78	98	62
SB523	0.0149	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	55	45	98	64
SB524	0.0367	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	75	25	98	84
SB525	0.0066	Central West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	47	53	98	61
SB526	0.0314	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	65	35	98	84
SB527	0.0281	Central West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	78	22	98	80
SB528	0.0215	Central West	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	12	88	98	64
SB529	0.0574	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	30	70	98	83
SB53	0.0087	Central South	900	0.005	Trapezoid	0.025	2	25	35	70	0.02	0.02	0.1	0.4	29	71	98	74
SB530	0.0684	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	40	60	98	89
SB531	0.0883	North	3000	0.005	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	50	50	98	87
SB532	0.0047	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	95	5	98	58
SB533	0.0264	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	68	32	98	79
SB534	0.0287	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	20	80	98	77
SB535	0.0504	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	51	49	98	72
SB536	0.0225	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	55	45	98	87
SB537	0.1123	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	38	62	98	88
SB538	0.0250	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	36	64	98	73
SB539	0.0255	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	90	10	98	74
SB54	0.0064	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	75	25	98	73
SB540	0.0229	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	80	20	98	89
SB541	0.0197	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	78	22	98	74
SB542	0.0592	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	63	37	98	83
SB543	0.0191	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	19	81	98	77
SB544	0.0099	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	90	10	98	80
SB545	0.0017	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	75	25	98	80
SB546	0.0059	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	95	5	98	74
SB547	0.0183	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	95	5	98	80
SB548	0.0066	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	81	19	98	74
SB549	0.0279	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	40	60	98	80
SB55	0.0070	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	75	25	98	69
SB550	0.0374	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	40	60	98	80
SB553	0.0435	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	90	10	98	80
SB554a	0.0562	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	37	63	98	76
SB554b	0.0048	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	69	31	98	76
SB555	0.0374	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	27	73	98	68
SB556	0.0562	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	7	93	98	62
SB557	0.0353	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	7	93	98	62
SB558	0.0575	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	24	76	98	66
SB559a	0.0450	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	26	74	98	74
SB559b	0.0346	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	26	74	98	74
SB559c	0.0182	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	70	30	98	74
SB56	0.0090	Central	600	0.009	Trapezoid	0.035	3	1.5	35	100	0.02	0.02	0.1	0.4	50	50	98	79
SB560	0.0260	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	24	76	98	80
SB562	0.0206	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	4	96	98	84

Subasin*	Area mi^2	Major Basin	Main Channel						Length		Slope		Roughness		Area		Curve #	
			Length	Slope	Shape	n	Dim1	Dim2	1	2	1	2	1	2	Imp. %	Perv. %	1	2
SB563	0.0308	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	40	60	98	80
SB566	0.0695	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	26	74	98	83
SB568	0.0127	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	27	73	98	73
SB57	0.0077	Central	1600	0.025	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	50	50	98	80
SB570	0.0124	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	28	72	98	76
SB572	0.0221	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	23	77	98	67
SB573a	0.0554	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	26	74	98	76
SB573b	0.0098	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	26	74	98	76
SB574	0.0211	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	50	50	98	84
SB575	0.0208	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	40	60	98	77
SB576	0.0167	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	36	64	98	77
SB577	0.0419	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	60	40	98	89
SB578	0.1268	Central	1160	0.005	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	95	5	98	66
SB579	0.0154	North East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	10	90	98	79
SB58	0.0176	Central	1000	0.003	Trapezoid	0.025	2	25	48	100	0.01	0	0.1	0.4	84	16	98	81
SB580	0.0081	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	29	71	98	69
SB581	0.0074	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	6	94	98	80
SB582	0.0343	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	17	83	98	69
SB583	0.0202	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	56	44	98	83
SB584	0.0155	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	45	55	98	74
SB585	0.0236	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	80	20	98	78
SB586	0.0103	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	19	81	98	66
SB587	0.0390	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	16	84	98	71
SB588	0.0088	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	75	25	98	76
SB589	0.0357	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	22	78	98	68
SB59	0.0070	Central	2250	0.017	Circle	0.015	1.5		48	15	0.02	0.02	0.1	0.4	80	20	98	85
SB590a	0.0177	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	22	78	98	74
SB590b	0.0139	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	0	100	98	74
SB591	0.0389	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	2	98	98	64
SB592	0.0101	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	19	81	98	78
SB593	0.0134	Central West	860	0.01	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	20	80	98	77
SB594	0.0081	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	70	30	98	89
SB595	0.0504	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	77	23	98	81
SB596	0.0171	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	76	24	98	63
SB597	0.0066	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	74	26	98	72
SB598	0.0398	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	55	45	98	80
SB599	0.0225	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	65	35	98	72
SB6	0.0145	Central South	1127	0.009	Trapezoid	0.015	2	25	50	70	0.02	0.02	0.1	0.4	27	73	98	74
SB60	0.0083	Central	400	0.01	Trapezoid	0.025	2	25	100	100	0.02	0.02	0.1	0.4	70	30	98	67
SB603a	0.0228	Central South	300	0.01	Circle	0.013	1.5		250	20	0.02	0.02	0.1	0.4	78	22	98	75
SB603b	0.0098	Central South	300	0.01	Circle	0.013	1.5		250	20	0.02	0.02	0.1	0.4	90	10	98	75
SB61	0.0061	Central	1300	0.025	Trapezoid	0.025	2	25	48	15	0.02	0.02	0.1	0.4	74	26	98	81
SB615	0.0074	Central West	1100	0.003	Trapezoid	0.015	2	25	50	100	0.02	0.02	0.1	0.4	63	37	98	74
SB616	0.0020	Central West	507	0.006	Trapezoid	0.025	2	25	35	30	0.02	0.02	0.1	0.4	50	50	98	77
SB618	0.0038	Central West	745	0.02	Trapezoid	0.025	2	25	50	50	0.02	0.02	0.1	0.4	81	19	98	75
SB619	0.0049	Central West	744	0.006	Trapezoid	0.025	2	25	50	50	0.01	0.01	0.1	0.4	79	21	98	74
SB62	0.0023	Central	460	0.017	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	44	56	98	75
SB620	0.0093	Central South	1450	0.013	Trapezoid	0.025	2	25	351	100	0.02	0.02	0.1	0.4	21	79	98	74
SB621	0.0228	Central South	1770	0.013	Trapezoid	0.025	2	25	50	100	0.02	0.02	0.1	0.4	50	50	98	74
SB622	0.0152	Central South	1700	0.008	Trapezoid	0.025	2	25	50	100	0.02	0.02	0.1	0.4	84	16	98	61
SB623	0.0069	Central South	1850	0.008	Trapezoid	0.025	2	25	50	50	0.02	0.02	0.1	0.4	90	10	98	62
SB624	0.0490	Central	2600	0.005	Trapezoid	0.015	2	25	100	15	0.02	0.02	0.1	0.4	81	19	98	66
SB625	0.0096	Central	1000	0.003	Trapezoid	0.025	2	25	40	40	0.02	0.02	0.1	0.4	80	20	98	69
SB626	0.0104	Central	1500	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	31	69	98	66
SB627	0.0139	Central	1500	0.0013	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	60	40	98	89
SB628	0.0046	Central	1600	0.005	Trapezoid	0.025	2	25	35	50	0.02	0.02	0.1	0.4	70	30	98	89
SB63	0.0081	Central	950	0.01	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	12	88	98	76
SB630	0.0240	East	1200	0.0033	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	75	25	98	61
SB631	0.0192	East	1500	0.0033	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	64	36	98	63
SB632	0.0157	Central South	727	0.008	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	95	5	98	74
SB634	0.0241	East	1200	0.01	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	35	65	98	65
SB635	0.0048	East	755	0.01	Trapezoid	0.025	2	25	50	100	0.02	0.02	0.1	0.4	50	50	98	61
SB637	0.0103	East	1319	0.011	Trapezoid	0.025	2	25	35	50	0.02	0.02	0.1	0.4	45	55	98	80
SB639	0.0208	Central South	1130	0.007	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	32	68	98	70
SB64	0.0138	Central	460	0.017	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	5	95	98	63
SB640	0.0147	Central South	727	0.008	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	28	72	98	59
SB641	0.0140	West	920	0.01	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	24	76	98	81
SB642	0.0143	West	1120	0.005	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	24	76	98	81
SB643	0.0107	Central	1713	0.0041	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	36	64	98	74
SB644	0.0127	Central	1713	0.0041	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	36	64	98	74
SB645	0.0005	North	1817	0.003	Trapezoid	0.015	2	25	35	15	0.02	0.02	0.1	0.4	95	5	98	80
SB646	0.0497	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	30	70	98	84

Subasin*	Area mi^2	Major Basin	Main Channel						Length		Slope		Roughness		Area		Curve #	
			Length	Slope	Shape	n	Dim1	Dim2	1	2	1	2	1	2	Imp. %	Perv. %	1	2
SB647	0.0082	North	1817	0.003	Trapezoid	0.015	2	25	35	50	0.02	0.02	0.1	0.4	80	20	98	80
SB648	0.0028	North	1817	0.003	Trapezoid	0.015	2	25	35	15	0.02	0.02	0.1	0.4	90	10	98	80
SB65	0.0106	Central	850	0.002	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	21	79	98	78
SB650	0.0023	North	1817	0.003	Trapezoid	0.015	2	25	35	15	0.02	0.02	0.1	0.4	90	10	98	80
SB652	0.0030	North	1817	0.003	Trapezoid	0.015	2	25	35	15	0.02	0.02	0.1	0.4	99	1	98	89
SB654	0.0098	North	1817	0.003	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	63	37	98	84
SB655	0.0074	North	1817	0.003	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	85	15	98	84
SB656	0.0065	North	1817	0.003	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	80	20	98	80
SB658	0.0086	Central South	727	0.008	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	44	56	98	59
SB66	0.0120	Central	400	0.01	Trapezoid	0.025	2	25	100	100	0.02	0.02	0.1	0.4	27	73	98	80
SB660	0.0086	Central South	727	0.008	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	30	70	98	59
SB661	0.0929	East	1817	0.003	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	25	75	98	77
SB661b	0.0667	East	1817	0.003	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	25	75	98	77
SB662	0.0483	East	1817	0.003	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	23	77	98	74
SB664	0.0261	East	1817	0.003	Trapezoid	0.025	2	25	35	15	0.02	0.02	0.1	0.4	95	5	98	80
SB665	0.0151	Central South	1873	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	50	50	98	70
SB666	0.0070	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	44	56	98	70
SB667	0.0383	West	1817	0.005	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	5	95	98	80
SB668	0.0043	West	1817	0.005	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	25	75	98	80
SB669	0.0179	West	1817	0.005	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	9	91	98	49
SB67	0.0115	Central	400	0.01	Trapezoid	0.025	2	25	100	100	0.01	0.01	0.1	0.4	35	65	98	80
SB670	0.0113	East	1817	0.005	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	98	2	98	80
SB671	0.0293	East	1817	0.005	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	98	2	98	80
SB672	0.0242	East	1817	0.003	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	45	55	98	80
SB673	0.0350	East	1817	0.003	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	60	40	98	80
SB674	0.0117	East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	50	50	98	70
SB68	0.0092	Central	1500	0.019	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	20	80	98	73
SB69	0.0139	Central	1400	0.026	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	16	84	98	67
SB7	0.0111	Central South	860	0.01	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	20	80	98	77
SB70	0.0064	Central	770	0.0026	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	38	62	98	85
SB71	0.0117	Central	1300	0.025	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	22	78	98	70
SB72	0.0021	Central	470	0.0072	Trapezoid	0.025	2	25	50	15	0.02	0.02	0.1	0.4	95	5	98	86
SB73	0.0230	Central	1500	0.019	Trapezoid	0.025	2	25	140	100	0.05	0.02	0.1	0.4	29	71	98	64
SB74	0.0019	Central	500	0.007	Trapezoid	0.025	2	25	48	15	0.02	0.02	0.1	0.4	80	20	98	80
SB75	0.0038	Central	340	0.011	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	10	90	98	76
SB76	0.0152	Central	1170	0.017	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	18	82	98	67
SB77	0.0236	Central	1000	0.02	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	38	62	98	64
SB78	0.0196	Central	520	0.005	Trapezoid	0.025	2	25	100	40	0.02	0.02	0.1	0.4	75	25	98	86
SB79	0.0091	Central	300	0.01	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	39	61	98	76
SB8	0.0199	Central South	1184	0.004	Trapezoid	0.025	2	25	50	70	0.02	0.02	0.1	0.4	60	40	98	77
SB80	0.0042	Central	520	0.0038	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	71	29	98	78
SB81	0.0117	Central	1100	0.0082	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	19	81	98	77
SB82	0.0052	Central	700	0.017	Trapezoid	0.025	2	25	48	15	0.02	0.02	0.1	0.4	98	2	98	90
SB83	0.0089	Central	1100	0.0025	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	37	63	98	88
SB84	0.0093	Central	1170	0.0075	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	29	71	98	67
SB85	0.0185	Central	1170	0.012	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	38	62	98	73
SB86	0.0120	Central	1200	0.0092	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	22	78	98	69
SB87	0.0222	Central	1170	0.0075	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	23	77	98	69
SB89	0.0104	Central	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	24	76	98	49
SB9	0.0141	Central South	732	0.004	Trapezoid	0.025	2	25	35	100	0.02	0.02	0.1	0.4	20	80	98	73
SB90	0.0125	Central South	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	7	93	98	75
SB92	0.0168	Central	1150	0.007	Trapezoid	0.4	2	25	35	100	0.02	0.02	0.1	0.4	19	81	98	72
SB93	0.0227	Central South	1750	0.009	Circle	0.015	4.5		50	100	0.02	0.02	0.1	0.4	23	77	98	74
SB94	0.0068	Central	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	26	74	98	40
SB95	0.0151	Central	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	15	85	98	42
SB96a	0.0098	Central	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	31	69	98	74
SB96b	0.0056	Central	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	74	26	98	74
SB96c	0.0049	Central	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	19	81	98	74
SB97	0.0121	North	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	9	91	98	63
SB98	0.0249	Central East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	21	79	98	66
SB99	0.0235	Central East	1817	0.003	Trapezoid	0.015	2	25	35	100	0.02	0.02	0.1	0.4	24	76	98	62

*Attributes of subbasins located in the South Basin can be seen on the CD located in Appendix D

CONVEYANCE CAPACITIES

Storm drainage facilities and features conveying storm drainage from subbasins have been represented in the model. Smaller storm drainage facilities within subbasins are represented in the characteristics of the subbasin in which they are located.

As explained in the report, capacities of storm drainage pipes were estimated based upon size, slope, material type, Manning's equation, and approximated inlet capacity limitations. These estimated conveyance capacities were then compared against the corresponding HEC-HMS model peak discharge. The following table includes capacities and model output comparison. Each of the columns in the table is labeled and described below:

Col.	Description
1	Assigned conveyance ID. Each conveyance ID name is prefixed by "CN_" or "CV_" followed by the identification number of the conveyance.
2	Length of the conveyance based upon the 2000 SDMP report or upon city data of in-place pipes.
3	Slope of the conveyance based upon the 2000 SDMP or upon 4 ft and 0.5 m contours for Murray City and depths corresponding to in-place pipes.
4	Mannings n value based upon the material of the conveyance.
5	Shape of the conveyance.
6	Diameter of circular conveyances.
7	Width of trapezoidal conveyances, rectangular conveyances, and elliptical (squash) pipe.
8	Height of trapezoidal conveyances, rectangular conveyances, and elliptical (squash) pipe.
9	Side slope of trapezoidal conveyances, horizontal:vertical.
10	Capacity of conveyance based on Manning's Equation assuming full flow in the pipe or channel.

$$\text{Mannings Equation: } Q(cfs) = \left(\frac{1.486}{n}\right)(A)\left(\frac{A}{Pw}\right)^{\frac{2}{3}}(S)^{\frac{1}{2}}$$

11	Inlet control capacity. Based on a maximum velocity of 8 ft/s for pipes equal to or less than 30 inches in diameter and 10 ft/s for pipes with diameters larger than 30 inches.
12	Estimated capacity for the conveyance. Based upon the controlling or smaller capacity between capacity due to Manning's Equation and inlet control capacity.
13	Peak flow in the conveyance. The peak flow is from the largest peak flow between the four 10-year storm flows. The peak flows can be seen in the 2010 Existing Peak Flows for All Elements.
14	Percentage of the peak flow in relation to the capacity of each conveyance.

Murray City Storm Drain Master Plan
Conveyance Attributes
026.36.800
11/21/2018

HMI_ID	Length	Slope	n	Shape	Diameter	Dim_1	Dim_2	Dim_3	$Cap_{Manning}$	Cap_{vel}	Capacity	Peak	% of Capacity
	ft	ft/ft			ft	ft	ft	h:v	cfs	cfs	cfs	cfs	
CN10	301.0	0.0283	0.013	Circle	2				38.04	25.13	25.13	29.8	119%
CN11	50.5	0.0245	0.024	Circle	1.5				8.91	14.14	8.91	6.3	71%
CN11	274.7	0.0154	0.013	Circle	2				28.07	25.13	25.13	6.3	25%
CN11	132.0	-0.0268	0.013	Circle	1.25				0.00	9.82	0.00	6.3	
CN11	11.8	0.0070	0.024	Circle	2				10.24	25.13	10.24	6.3	62%
CN11	93.9	0.0375	0.013	Circle	1.5				0.00	14.14	0.00	0.0	
CN11	41.2	0.0243	0.013	Circle	2				35.25	25.13	25.13	6.3	25%
CN1101b	157.0	0.0023	0.013	Circle	3.33				42.30	87.09	42.30	279.6	661%
CN1101b	150.5	0.0033	0.013	Circle	3.33				50.41	87.09	50.41	279.6	555%
CN1101b	191.0	0.0047	0.013	Circle	3.33				60.30	87.09	60.30	279.6	464%
CN1101b	149.8	0.0005	0.013	Circle	3.33				20.41	87.09	20.41	279.6	1370%
CN1101b	200.3	-0.0125	0.013	Circle	3.33				0.00	87.09	0.00	279.6	
CN1101b	9.5	0.2865	0.013	Circle	3.33				472.85	87.09	87.09	279.6	321%
CN1101b	74.0	0.0023	0.013	Circle	3.33				42.34	87.09	42.34	279.6	660%
CN1101b	17.2	0.1208	0.013	Circle	3.33				306.99	87.09	87.09	279.6	321%
CN1101b	147.1	0.0057	0.013	Circle	3.33				66.76	87.09	66.76	279.6	419%
CN1101b	218.2	-0.0007	0.013	Circle	3.33				0.00	87.09	0.00	279.6	
CN1102	26.8	0.0542	0.013	Circle	3.33				205.64	87.09	87.09	254.6	292%
CN1102	477.1	0.0035	0.013	Circle	3.33				52.42	87.09	52.42	254.6	486%
CN1103	52.7	0.0017	0.013	Circle	3				27.56	70.69	27.56	164.1	595%
CN1103	41.5	-0.0072	0.024	Circle	3.33				0.00	87.09	0.00	164.1	
CN1103	189.9	0.0109	0.013	Circle	3				69.63	70.69	69.63	164.1	236%
CN1103	207.8	0.0047	0.013	Circle	2.5				28.03	49.09	28.03	164.1	586%
CN1103	390.2	0.0061	0.024	Circle	3.33				37.29	87.09	37.29	164.1	440%
CN1103	85.7	0.0019	0.024	Circle	3				15.61	70.69	15.61	164.1	1051%
CN1103	115.7	0.0124	0.024	Circle	3.33				53.39	87.09	53.39	164.1	307%
CN1103b	13.3	0.0015	0.013	Circle	2.5				15.93	49.09	15.93	82.2	516%
CN1103b	338.7	0.0072	0.013	Circle	2.5				34.74	49.09	34.74	82.2	237%
CN1103b	208.2	0.0072	0.013	Circle	2.5				34.70	49.09	34.70	82.2	237%
CN1103b	315.5	0.0472	0.013	Circle	2.5				89.07	49.09	49.09	82.2	167%
CN1103b	60.7	0.1011	0.013	Circle	2.5				130.41	49.09	49.09	82.2	167%
CN1103c	128.5	0.0045	0.013	Circle	2.25				20.80	31.81	20.80	110.9	533%
CN1103c	98.1	0.0045	0.013	Circle	2.25				21	31.81	20.74	110.9	535%
CN1103c	64.4	0.0051	0.013	Circle	2.25				22.16	31.81	22.16	110.9	500%
CN1103c	65.0	0.0134	0.013	Circle	3				77.19	70.69	70.69	110.9	157%
CN1103c	136.3	0.0045	0.013	Circle	2.25				20.89	31.81	20.89	110.9	531%
CN1103c	74.6	0.0050	0.013	Circle	2.25				21.81	31.81	21.81	110.9	508%
CN1103c	98.3	0.0045	0.013	Circle	2.25				20.72	31.81	20.72	110.9	535%
CN1103c	159.5	0.0134	0.013	Circle	2.25				35.87	31.81	31.81	110.9	349%
CN1103c	120.7	0.0017	0.013	Circle	2.25				12.61	31.81	12.61	110.9	880%
CN1103c	78.0	0.0214	0.013	Circle	2.25				45.32	31.81	31.81	110.9	349%
CN1103c	56.5	0.0016	0.013	Circle	2				9.03	25.13	9.03	110.9	1228%
CN1103d	198.0	0.0130	0.013	Circle	2				25.77	25.13	25.13	54.0	215%
CN1103d	325.0	0.0130	0.013	Circle	2				25.75	25.13	25.13	54.0	215%
CN1104	74.9	0.0071	0.013	Circle	2.5				34.51	49.09	34.51	71.6	207%
CN1104	84.4	0.0072	0.013	Circle	2.5				34.86	49.09	34.86	71.6	205%
CN1104	66.7	0.0064	0.013	Circle	2.5				32.93	49.09	32.93	71.6	217%
CN1104	46.2	0.0063	0.013	Circle	2.5				32.50	49.09	32.50	71.6	220%
CN111	117.1	0.0152	0.013	Circle	2				27.89	25.13	25.13	0.0	0%
CN111b	53.1	0.0226	0.013	Circle	2				0.00	25.13	0.00	0.0	
CN111b	57.6	0.0571	0.013	Circle	2				54.07	25.13	25.13	10.9	43%
CN111b	229.0	0.0529	0.013	Circle	2				52.05	25.13	25.13	10.9	43%
CN113	412.4	0.0083	0.013	Circle	4.5				179.34	159.04	159.04	196.4	123%
CN113	88.4	0.0037	0.013	Circle	4.5				120.15	159.04	120.15	196.4	163%
CN113	325.7	0.0038	0.013	Circle	4.5				121.35	159.04	121.35	196.4	162%
CN113	118.7	0.0073	0.013	Circle	4.5				168.37	159.04	159.04	196.4	123%
CN113	339.3	0.0073	0.013	Circle	4.5				168.13	159.04	159.04	196.4	123%
CN113	86.7	0.0082	0.013	Circle	4.5				177.91	159.04	159.04	196.4	123%
CN113	254.7	0.0081	0.013	Circle	4.5				177.28	159.04	159.04	196.4	123%
CN117	157.8	0.0093	0.013	Circle	1.5				10.14	14.14	10.14	8.1	80%
CN117	204.8	0.0038	0.013	Circle	1.5				6.44	14.14	6.44	8.1	126%
CN117	10.7	0.0700	0.013	Circle	1.5				27.79	14.14	14.14	8.1	57%
CN117	306.0	0.0042	0.013	Circle	1.5				6.79	14.14	6.79	8.1	119%
CN117	102.8	-0.0018	0.013	Circle	1.5				0.00	14.14	0.00	8.1	
CN117	300.6	0.0093	0.013	Circle	1.5				10.14	14.14	10.14	8.1	80%
CN117	51.6	0.0142	0.013	Circle	1.5				12.50	14.14	12.50	8.1	65%
CN117	296.8	0.0009	0.013	Circle	2				6.95	25.13	6.95	8.1	117%
CN117	398.5	0.0009	0.013	Circle	2				6.70	25.13	6.70	8.1	121%
CN118	336.2	0.0171	0.013	Circle	2.5				53.69	49.09	49.09	31.4	64%
CN118	71.9	0.0159	0.013	Circle	2.5				51.65	49.09	49.09	31.4	64%

HMI_ID	Length	Slope	n	Shape	Diameter	Dim_1	Dim_2	Dim_3	$Cap_{Manning}$	Cap_{vel}	Capacity	Peak	% of Capacity
	ft	ft/ft			ft	ft	ft	h:v	cfs	cfs	cfs	cfs	
CN118	293.9	0.0042	0.013	Circle	2.5				26.53	49.09	26.53	31.4	118%
CN118b	277.7	0.0060	0.024	Circle	2				9.47	25.13	9.47	9.2	97%
CN118b	53.0	0.0094	0.013	Circle	2				21.98	25.13	21.98	9.2	42%
CN118b	318.1	0.0187	0.013	Circle	2				30.94	25.13	25.13	9.2	37%
CN118b	291.6	0.0088	0.013	Circle	2				21.20	25.13	21.20	9.2	43%
CN118b	346.8	0.0036	0.013	Circle	1.5				6.28	14.14	6.28	9.2	146%
CN118b	297.2	0.0290	0.013	Circle	2				38.55	25.13	25.13	9.2	37%
CN118b	223.0	0.0089	0.024	Squash	0	3	2		19.48	37.7	19.48	9.2	47%
CN119	355.7	0.0055	0.024	Circle	1.25				2.60	9.82	2.60	5.9	227%
CN119	17.3	0.0475	0.024	Circle	1.25				7.62	9.82	7.62	5.9	77%
CN119	374.7	0.0118	0.024	Circle	1.25				3.80	9.82	3.80	5.9	155%
CN119	347.1	0.0075	0.024	Circle	1.25				3.03	9.82	3.03	5.9	194%
CN119b	88.4	-0.0012	0.025	Trapezoid	0	0.67	1	0.67	0.00	7.18	0.00	25.7	
CN119b	76.1	0.0548	0.025	Trapezoid	0	0.67	1	0.67	6.21	7.18	6.21	25.7	414%
CN119b	138.4	0.0095	0.025	Trapezoid	0	0.67	1	0.67	2.14	7.18	2.14	25.7	1202%
CN119b	123.4	0.0094	0.025	Trapezoid	0	0.67	1	0.67	2.12	7.18	2.12	25.7	1211%
CN119b	25.0	-0.0827	0.025	Trapezoid	0	0.67	1	0.67	0.00	7.18	0.00	25.7	
CN119b	157.9	0.0213	0.013	Circle	2				33.00	25.13	25.13	25.7	102%
CN12	629.7	0.0039	0.013	Circle	3				41.77	70.69	41.77	77.1	185%
CN120	19.3	0.0207	0.013	Circle	1.25				9.30	9.82	9.30	34.0	366%
CN120	253.4	0.0036	0.013	Circle	2				13.48	25.13	13.48	34.0	252%
CN1201	74.6	0.0052	0.013	Circle	2.5				29.66	49.09	29.66	43.5	147%
CN1201	195.5	0.0053	0.013	Circle	2.5				29.92	49.09	29.92	43.5	145%
CN1201	161.9	0.0041	0.013	Circle	2.5				26.19	49.09	26.19	43.5	166%
CN1201	286.3	0.0064	0.013	Circle	2.5				32.70	49.09	32.70	43.5	133%
CN1201	384.5	0.0054	0.013	Circle	2.5				30.10	49.09	30.10	43.5	145%
CN1202	213.9	0.0100	0.03	Trapezoid	0	0	0	3	181.40	0	181.40	57.3	32%
CN1202	46.0	-0.0365	0.024	Circle	2.5				0.00	49.09	0.00	57.3	
CN1202b	467.9	0.0080	0.024	Circle	1.5				5.09	14.14	5.09	9.1	179%
CN1202c	259.6	-0.0018	0.013	Circle	2				0.00	25.13	0.00	53.1	
CN1202c	16.9	-0.0024	0.024	Circle	3				0.00	70.69	0.00	53.1	
CN1202c	156.2	0.0097	0.013	Circle	1.5				10.33	14.14	10.33	53.1	514%
CN1202c	46.3	0.0002	0.013	Circle	1.5				1.54	14.14	1.54	53.1	3441%
CN1202c	99.9	-0.0168	0.013	Circle	1.5				0.00	14.14	0.00	53.1	
CN1203	133.7	0.0159	0.025	Trapezoid	0	0	0	0	0.00	0	0.00	25.3	
CN1203	139.3	-0.0005	0.013	Circle	2				0.00	25.13	0.00	25.3	
CN1203	41.5	0.1119	0.013	Circle	2				75.69	25.13	25.13	25.3	101%
CN1203	109.7	0.1298	0.013	Circle	2				81.49	25.13	25.13	25.3	101%
CN1203	202.2	0.0242	0.013	Circle	2				35.18	25.13	25.13	25.3	101%
CN1203b	67.5	0.0705	0.024	Circle	2				32.53	25.13	25.13	24.4	97%
CN1203b	456.1	-0.0001	0.025	Trapezoid	0	0	0	0	0.00	0	0.00	24.4	
CN1203b	270.9	0.0090	0.025	Trapezoid	0	0	0	0	0.00	0	0.00	24.4	
CN1203b	39.6	0.0033	0.013	Circle	2				12.96	25.13	12.96	24.4	188%
CN1203b	21.7	-0.0877	0.013	Circle	2				0.00	25.13	0.00	24.4	
CN1203b	75.9	0.0108	0.013	Circle	2				23.52	25.13	23.52	24.4	104%
CN1203b	60.0	0.0018	0.024	Circle	2				5.25	25.13	5.25	24.4	465%
CN1203b	65.0	-0.0011	0.025	Trapezoid	0	0	0	1.67	0.00	0	0.00	24.4	
CN1205	133.2	0.0055	0.013	Circle	2				16.75	25.13	16.75	37.2	222%
CN1205	167.6	0.0055	0.013	Circle	2				16.76	25.13	16.76	37.2	222%
CN1205	365.8	0.0035	0.013	Circle	2.5				24.26	49.09	24.26	37.2	153%
CN1205	172.2	0.0092	0.013	Circle	2				21.74	25.13	21.74	37.2	171%
CN1205	49.0	0.0681	0.013	Circle	1.75				41.36	19.24	19.24	37.2	193%
CN120b	5.0	0.0883	0.013	Trapezoid	0	0.9	0.1	3	38.95	28.8	38.95	54.6	140%
CN120b	30.4	0.0547	0.013	Circle	3				155.95	70.69	70.69	54.6	77%
CN120c	462.5	0.0058	0.013	Circle	2				17.16	25.13	17.16	41.3	241%
CN120c	256.5	0.0080	0.013	Circle	3				59.77	70.69	59.77	41.3	69%
CN121	121.3	0.0150	0.013	Circle	3				81.70	70.69	70.69	25.3	36%
CN121	5.4	0.2639	0.013	Circle	0.5				2.88	1.57	1.57	25.3	1611%
CN121	19.5	0.0041	0.025	Trapezoid	0	2	0.5	3	27.95	105	27.95	25.3	91%
CN121	184.0	0.0071	0.013	Circle	3				56.28	70.69	56.28	25.3	45%
CN121	92.4	-0.0053	0.013	Circle	2				0.00	25.13	0.00	25.3	
CN121	168.2	0.0042	0.024	Circle	3				23.39	70.69	23.39	25.3	108%
CN121	59.6	0.0149	0.013	Circle	3				81.51	70.69	70.69	25.3	36%
CN121	56.8	0.0076	0.013	Circle	2				19.68	25.13	19.68	25.3	129%
CN121	141.5	0.0076	0.013	Circle	2				19.77	25.13	19.77	25.3	128%
CN121	177.2	0.0075	0.013	Circle	2.5				35.54	49.09	35.54	25.3	71%
CN121	84.5	0.0042	0.013	Circle	3				43.17	70.69	43.17	25.3	59%
CN121	30.9	0.0043	0.013	Circle	3				43.75	70.69	43.75	25.3	58%
CN122	549.7	0.0077	0.013	Circle	3.33				77.76	87.09	77.76	304.1	391%
CN122	73.5	0.0057	0.013	Circle	3.33				66.79	87.09	66.79	304.1	455%
CN123b	2511.5	0.0071	0.025	Rectangle	0	0	0		0.00	0	0.00	296.6	
CN13	430.5	0.0052	0.013	Circle	3				47.90	70.69	47.90	75.0	157%
CN130	339.1	0.0126	0.013	Circle	2				25.39	25.13	25.13	26.4	105%
CN1301	390.2	0.0039	0.013	Circle	1.75				9.92	19.24	9.92	28.1	283%
CN1301	297.0	0.0110	0.013	Circle	2.33				35.81	34.11	34.11	28.1	82%
CN1301	200.1	0.0137	0.013	Circle	2.33				39.93	34.11	34.11	28.1	82%

HMI_ID	Length	Slope	n	Shape	Diameter	Dim_1	Dim_2	Dim_3	$Cap_{Manning}$	Cap_{vel}	Capacity	Peak	% of Capacity
	ft	ft/ft			ft	ft	ft	h:v	cfs	cfs	cfs	cfs	
CN1301	41.0	0.0039	0.013	Squash	0	3.3333333	2		27.04	52.36	27.04	28.1	104%
CN1301	110.1	0.0115	0.013	Circle	1.75				17.02	19.24	17.02	28.1	165%
CN1302b	253.3	0.0060	0.024	Circle	2				9.46	25.13	9.46	28.1	297%
CN1302b	197.5	0.0062	0.013	Circle	1.5				8.29	14.14	8.29	28.1	339%
CN1302b	28.1	0.0107	0.013	Circle	2				23.39	25.13	23.39	28.1	120%
CN1302b	131.3	-0.0041	0.013	Circle	1.5				0.00	14.14	0.00	28.1	
CN1302b	35.7	0.0070	0.013	Circle	1.5				8.80	14.14	8.80	28.1	319%
CN1302b	168.2	0.0052	0.013	Circle	1.5				7.55	14.14	7.55	28.1	372%
CN1302b	24.9	0.0233	0.024	Circle	2				18.70	25.13	18.70	28.1	150%
CN1302b	94.4	0.0055	0.013	Circle	1.5				7.80	14.14	7.80	28.1	360%
CN1302b	87.8	0.0093	0.013	Circle	1.5				10.15	14.14	10.15	28.1	277%
CN1302b	602.0	0.0024	0.024	Circle	2				5.99	25.13	5.99	28.1	469%
CN1302b	99.3	0.0123	0.013	Circle	1.5				11.65	14.14	11.65	28.1	241%
CN1302b	217.7	0.0067	0.013	Circle	1.5				8.60	14.14	8.60	28.1	327%
CN1302b	72.8	0.0091	0.013	Circle	1.5				10.00	14.14	10.00	28.1	281%
CN1302c	12.7	-0.0145	0.013	Circle	2				0.00	25.13	0.00	29.1	
CN1302c	29.7	0.1783	0.024	Circle	2				51.75	25.13	25.13	29.1	116%
CN1302c	110.5	0.0151	0.013	Circle	2				27.81	25.13	25.13	29.1	116%
CN1302c	18.0	-0.0144	0.024	Circle	2				0.00	25.13	0.00	29.1	
CN1302c	63.6	0.0008	0.013	Circle	2				6.34	25.13	6.34	29.1	459%
CN1302c	155.2	-0.0026	0.013	Circle	2				0.00	25.13	0.00	29.1	
CN1305	42.5	0.0584	0.024	Circle	2				29.62	25.13	25.13	71.2	283%
CN1305	440.4	0.0134	0.024	Circle	2				14.16	25.13	14.16	71.2	503%
CN1305	431.2	0.0075	0.024	Circle	2				10.62	25.13	10.62	71.2	670%
CN1307	254.1	0.0012	0.013	Circle	2.33				11.72	34.11	11.72	27.4	234%
CN1307	101.4	0.0090	0.013	Circle	2.33				32.33	34.11	32.33	27.4	85%
CN1307	251.2	0.0043	0.013	Circle	2.33				22.27	34.11	22.27	27.4	123%
CN1307	124.6	0.0061	0.013	Circle	2.33				26.65	34.11	26.65	27.4	103%
CN1307	55.4	0.0061	0.013	Circle	2.33				26.73	34.11	26.73	27.4	103%
CN1307	189.1	0.0062	0.013	Circle	2.33				26.84	34.11	26.84	27.4	102%
CN1307	247.5	0.0042	0.013	Circle	2				14.59	25.13	14.59	27.4	188%
CN1307	151.4	0.0043	0.013	Circle	2				14.82	25.13	14.82	27.4	185%
CN1307	250.4	0.0044	0.013	Circle	2.33				22.72	34.11	22.72	27.4	121%
CN1307	12.9	0.0047	0.013	Circle	2				15.44	25.13	15.44	27.4	177%
CN1307	35.6	0.0199	0.013	Circle	2				31.94	25.13	25.13	27.4	109%
CN1307	298.7	0.0043	0.013	Circle	2.33				22.25	34.11	22.25	27.4	123%
CN1307	71.3	0.0008	0.013	Circle	2.33				9.90	34.11	9.90	27.4	277%
CN1308	173.1	0.0128	0.013	Circle	1.25				7.32	9.82	7.32	10.1	138%
CN1308	63.6	0.0167	0.024	Circle	0				8.23	0	0.00	10.1	
CN1308	291.0	0.0059	0.013	Circle	1.25				4.95	9.82	4.95	10.1	204%
CN1308	33.3	0.0526	0.013	Circle	1.25				14.82	9.82	9.82	10.1	103%
CN1308	54.1	0.0277	0.013	Circle	1.25				10.76	9.82	9.82	10.1	103%
CN1308	33.9	0.0077	0.013	Circle	1.25				5.66	9.82	5.66	10.1	178%
CN1308	204.7	0.0079	0.013	Circle	1.25				5.75	9.82	5.75	10.1	176%
CN1308b	27.9	-0.0183	0.013	Circle	1.25				0.00	9.82	0.00	5.6	
CN131	383.5	0.0081	0.013	Circle	1.25				5.81	9.82	5.81	9.2	158%
CN131	74.2	0.0081	0.013	Circle	1.25				5.81	9.82	5.81	9.2	158%
CN1311b	368.9	0.0043	0.024	Circle	2				7.99	25.13	7.99	52.9	662%
CN1311c	197.5	0.0106	0.024	Circle	2				12.63	25.13	12.63	45.7	362%
CN1311c	439.4	0.0183	0.024	Circle	2				16.58	25.13	16.58	45.7	276%
CN1311c	369.0	0.0099	0.024	Circle	2				12.17	25.13	12.17	45.7	376%
CN1311c	129.6	0.0089	0.024	Circle	2				11.55	25.13	11.55	45.7	396%
CN1311c	180.5	0.0067	0.024	Circle	2				10.03	25.13	10.03	45.7	456%
CN132	42.9	0.0170	0.013	Circle	1.25				8.43	9.82	8.43	12.8	152%
CN132	278.1	0.0049	0.013	Circle	1.25				4.52	9.82	4.52	12.8	283%
CN135	180.1	0.0027	0.024	Circle	1.25				1.81	9.82	1.81	1.4	78%
CN136	48.1	0.0000	0.024	Circle	1.25				0.00	9.82	0.00	1.4	
CN14	302.5	0.0086	0.024	Circle	2				11.34	25.13	11.34	49.8	439%
CN1403	309.0	0.0055	0.013	Circle	2				16.83	25.13	16.83	31.5	187%
CN1403	302.8	0.0068	0.013	Circle	2				18.71	25.13	18.71	31.5	168%
CN1404	14.0	0.3964	0.024	Circle	1				12.15	6.28	6.28	7.7	123%
CN1404	162.1	-0.0015	0.013	Circle	2.33				0.00	34.11	0.00	7.7	
CN1404	66.5	-0.0093	0.025	Trapezoid	0	0	0	2	0.00	0	0.00	7.7	
CN1404	653.5	0.0026	0.024	Squash	0	2.3333333	1.6666667		5.99	24.43	5.99	7.7	129%
CN1404	19.7	0.1014	0.013	Circle	2.33				108.66	34.11	34.11	7.7	23%
CN1404b	141.3	0.0096	0.013	Circle	1.75				15.54	19.24	15.54	5.9	38%
CN15	170.4	0.0121	0.013	Circle	2				24.87	25.13	24.87	65.8	265%
CN15	39.9	0.0055	0.013	Circle	2				16.80	25.13	16.80	65.8	392%
CN15	366.0	0.0121	0.013	Circle	2				24.92	25.13	24.92	65.8	264%
CN15	64.5	0.0186	0.013	Circle	2				30.85	25.13	25.13	65.8	262%
CN1502	141.9	0.0126	0.024	Circle	2				13.76	25.13	13.76	5.4	39%
CN1502	137.4	-0.0016	0.024	Circle	2				0.00	25.13	0.00	5.4	
CN1502	74.5	0.0063	0.013	Rectangle	0	4	2.3333333		69.12	93.33	69.12	5.4	8%
CN1503b	198.8	0.0389	0.024	Circle	3				71.29	70.69	70.69	31.2	44%
CN1503b	155.4	-0.0200	0.013	Circle	2.5				0.00	49.09	0.00	31.2	
CN1503b	221.2	0.0033	0.013	Circle	2.5				23.40	49.09	23.40	31.2	133%

HMI_ID	Length	Slope	n	Shape	Diameter	Dim_1	Dim_2	Dim_3	$Cap_{Manning}$	Cap_{vel}	Capacity	Peak	% of Capacity
	ft	ft/ft			ft	ft	ft	h:v	cfs	cfs	cfs	cfs	
CN1503b	195.3	0.0033	0.013	Circle	2.5				23.48	49.09	23.48	31.2	133%
CN1503b	43.8	0.1207	0.024	Circle	2				42.57	25.13	25.13	31.2	124%
CN1503b	20.8	0.0034	0.013	Circle	2.5				23.78	49.09	23.78	31.2	131%
CN1503b	309.6	0.0053	0.025	Trapezoid	0	0	0	0	0.00	0	0.00	31.2	
CN1503b	139.1	0.0032	0.013	Circle	2.5				23.33	49.09	23.33	31.2	134%
CN1503b	73.6	0.0054	0.013	Circle	2.5				30.23	49.09	30.23	31.2	103%
CN1503b	99.6	0.0040	0.013	Circle	2.5				26.00	49.09	26.00	31.2	120%
CN1503b	63.2	0.0041	0.013	Circle	2.5				26.30	49.09	26.30	31.2	119%
CN1503b	433.0	-0.0019	0.013	Circle	2.5				0.00	49.09	0.00	31.2	
CN1503b	330.3	-0.0074	0.025	Trapezoid	0	1	0.5	3	0.00	75	0.00	31.2	
CN1503b	161.5	0.0077	0.013	Circle	2.5				36.09	49.09	36.09	31.2	86%
CN1505	145.6	0.0530	0.024	Circle	3				83.14	70.69	70.69	33.6	48%
CN1505	170.0	0.0076	0.024	Circle	3				31.59	70.69	31.59	33.6	106%
CN1505	38.4	0.0060	0.024	Circle	3				27.94	70.69	27.94	33.6	120%
CN1505	281.8	0.0077	0.024	Circle	3				31.63	70.69	31.63	33.6	106%
CN1505	102.0	0.0076	0.024	Circle	3				31.59	70.69	31.59	33.6	106%
CN1505b	100.4	-0.0598	0.013	Circle	1.67				0.00	17.52	0.00	27.9	
CN1505c	1224.2	0.0188	0.013	Circle	1.67				19.09	17.52	17.52	0.0	0%
CN1507	114.6	-0.0003	0.024	Circle	3				0.00	70.69	0.00	23.5	
CN1507	85.2	0.0127	0.024	Circle	3				40.67	70.69	40.67	23.5	58%
CN1507	105.9	-0.0003	0.024	Circle	3				0.00	70.69	0.00	23.5	
CN1507	14.9	0.1850	0.024	Circle	3				155.39	70.69	70.69	23.5	33%
CN1507	99.3	0.0394	0.013	Circle	3				132.33	70.69	70.69	23.5	33%
CN1512	173.1	0.0142	0.013	Circle	1.5				12.52	14.14	12.52	0.0	0%
CN1512	267.9	0.0140	0.013	Circle	1.5				12.44	14.14	12.44	0.0	0%
CN1512b	182.1	0.0000	0.024	Squash	0	3	2		0.00	37.7	0.00	6.4	
CN1512b	259.8	0.0048	0.024	Squash	0	2.75	2		12.83	34.56	12.83	6.4	50%
CN1512b	285.8	0.0041	0.024	Squash	0	3	2		13.19	37.7	13.19	6.4	49%
CN1512b	24.3	0.0082	0.024	Squash	0	3	2		18.71	37.7	18.71	6.4	34%
CN1512b	93.4	0.0081	0.024	Squash	0	3	2		18.60	37.7	18.60	6.4	34%
CN1512b	97.9	0.0009	0.024	Squash	0	3	2		6.25	37.7	6.25	6.4	102%
CN1512d	476.5	0.0071	0.013	Circle	2.5				34.65	49.09	34.65	0.0	0%
CN1512d	86.2	0.0078	0.013	Circle	2				19.95	25.13	19.95	0.0	0%
CN1512d	37.6	0.0306	0.013	Circle	2				39.58	25.13	25.13	0.0	0%
CN1512d	295.0	0.0040	0.013	Circle	2				14.37	25.13	14.37	0.0	0%
CN1512d	39.1	0.0105	0.013	Circle	2				23.16	25.13	23.16	0.0	0%
CN1512d	9.5	0.3002	0.025	Trapezoid	0	0	0.75	2	69.51	24	69.51	0.0	0%
CN1512d	129.7	0.0156	0.013	Circle	2				28.24	25.13	25.13	0.0	0%
CN1512d	115.0	0.0155	0.013	Circle	2				28.14	25.13	25.13	0.0	0%
CN1513	232.6	0.0126	0.024	Circle	1.5				6.40	14.14	6.40	20.6	323%
CN1514	273.9	0.0099	0.024	Circle	1.5				5.66	14.14	5.66	3.1	55%
CN1514	122.9	0.0130	0.024	Circle	1.5				6.49	14.14	6.49	3.1	48%
CN1514	175.1	0.0181	0.024	Circle	1.5				7.64	14.14	7.64	3.1	41%
CN1514	85.4	0.0367	0.024	Circle	1.5				10.89	14.14	10.89	3.1	28%
CN1514	353.7	0.0077	0.024	Circle	1.5				5.00	14.14	5.00	3.1	62%
CN1514	286.3	0.0272	0.024	Circle	1.5				9.38	14.14	9.38	3.1	33%
CN1514	141.3	-0.0001	0.024	Circle	1.5				0.00	14.14	0.00	3.1	
CN158	66.4	0.0114	0.013	Circle	5				278.60	196.35	196.35	132.9	68%
CN158	48.3	0.0060	0.013	Circle	5				201.80	196.35	196.35	132.9	68%
CN158	63.1	0.0084	0.013	Circle	5				238.68	196.35	196.35	132.9	68%
CN158	64.5	-0.0078	0.013	Circle	5				0.00	196.35	0.00	132.9	
CN158	586.9	0.0109	0.013	Circle	5				271.76	196.35	196.35	132.9	68%
CN158	81.5	0.0091	0.013	Circle	5				248.24	196.35	196.35	132.9	68%
CN158	137.2	0.0068	0.013	Circle	5				214.44	196.35	196.35	132.9	68%
CN159	25.3	0.5120	0.024	Circle	1.25				25.04	9.82	9.82	147.8	1505%
CN159	73.6	0.0058	0.013	Circle	5.5				256.69	237.58	237.58	147.8	62%
CN159	72.2	0.0058	0.013	Circle	5.5				256.19	237.58	237.58	147.8	62%
CN159	109.1	0.0058	0.013	Circle	5.5				255.14	237.58	237.58	147.8	62%
CN159	166.8	0.0058	0.013	Circle	5.5				254.77	237.58	237.58	147.8	62%
CN159	106.1	0.0057	0.013	Circle	5.5				254.57	237.58	237.58	147.8	62%
CN159	278.4	-0.0159	0.013	Circle	0				0.00	0	0.00	147.8	
CN160	43.1	0.0127	0.013	Circle	5				294.04	196.35	196.35	218.3	111%
CN160	678.6	0.0127	0.013	Circle	5.5				378.93	237.58	237.58	218.3	92%
CN1601	136.8	0.0084	0.013	Circle	1.75				14.53	19.24	14.53	12.5	86%
CN1601	283.9	0.0033	0.013	Circle	1.75				9.12	19.24	9.12	12.5	137%
CN1601	209.7	0.0040	0.013	Circle	1.75				9.97	19.24	9.97	12.5	125%
CN1601	184.5	0.0221	0.013	Circle	2				33.64	25.13	25.13	12.5	50%
CN1606	66.9	0.0019	0.024	Circle	1				0.85	6.28	0.85	19.4	2280%
CN1606	69.2	0.0020	0.024	Circle	1				0.87	6.28	0.87	19.4	2235%
CN1606	224.6	0.0076	0.024	Circle	1				1.68	6.28	1.68	19.4	1152%
CN1606	79.1	0.0019	0.024	Circle	1				0.84	6.28	0.84	19.4	2308%
CN1606	63.5	-0.0118	0.024	Circle	1				0.00	6.28	0.00	19.4	
CN1606	126.0	0.0347	0.024	Circle	1				3.59	6.28	3.59	19.4	540%
CN1606b	50.3	0.0330	0.013	Rectangle	0	2	3		88.61	60	60.00	25.7	43%
CN1606b	282.6	0.0114	0.013	Rectangle	0	3	2		52.00	60	52.00	25.7	49%
CN161	377.0	0.0019	0.013	Circle	4.33				76.62	147.25	76.62	86.7	113%

HMI_ID	Length	Slope	n	Shape	Diameter	Dim_1	Dim_2	Dim_3	$Cap_{Manning}$	Cap_{vel}	Capacity	Peak	% of Capacity
	ft	ft/ft			ft	ft	ft	h:v	cfs	cfs	cfs	cfs	
CN161	86.4	0.0185	0.013	Circle	4.33				242.00	147.25	147.25	86.7	59%
CN161	396.1	0.0025	0.013	Circle	4.33				88.44	147.25	88.44	86.7	98%
CN161	38.1	0.0024	0.013	Circle	4.33				86.38	147.25	86.38	86.7	100%
CN161	27.8	0.0018	0.013	Circle	4.33				75.35	147.25	75.35	86.7	115%
CN162	119.8	0.0413	0.013	Circle	4.33				361.45	147.25	147.25	83.5	57%
CN163	17.1	-0.0480	0.013	Trapezoid	0	1	1	1.5	0.00	30	0.00	30.0	
CN163	60.2	0.0038	0.013	Trapezoid	0	1	1	1.5	21.19	30	21.19	30.0	142%
CN163	110.4	0.0048	0.013	Trapezoid	0	1	1	1.5	23.76	30	23.76	30.0	126%
CN163	126.5	0.0281	0.013	Circle	2				37.95	25.13	25.13	30.0	119%
CN163	16.8	-0.0416	0.013	Trapezoid	0	1	1	1.5	0.00	30	0.00	30.0	
CN163	49.5	0.0063	0.013	Trapezoid	0	1	1	1.5	27.12	30	27.12	30.0	111%
CN163	9.2	0.0641	0.013	Trapezoid	0	1	1	1.5	86.79	30	86.79	30.0	35%
CN163	387.3	0.0011	0.013	Trapezoid	0	1	1	1.5	11.42	30	11.42	30.0	263%
CN163	63.5	0.0046	0.013	Trapezoid	0	1	1	1.5	23.17	30	23.17	30.0	129%
CN163	43.1	0.0141	0.013	Trapezoid	0	1	1	1.5	40.78	30	40.78	30.0	74%
CN163	65.6	0.0035	0.013	Trapezoid	0	1	1	1.5	20.31	30	20.31	30.0	148%
CN163	179.2	0.0004	0.013	Trapezoid	0	1	1	1.5	7.24	30	7.24	30.0	414%
CN178	330.7	0.0058	0.013	Circle	2				17.19	25.13	17.19	37.1	216%
CN179	146.4	0.0270	0.025	Trapezoid	0	1	1	3	137.04	120	137.04	32.0	23%
CN180	534.0	0.0361	0.013	Circle	2				43.01	25.13	25.13	17.3	69%
CN181	217.9	0.0010	0.013	Circle	2.5				70.11	49.09	49.09	88.1	179%
CN183	47.6	-0.0093	0.013	Circle	2.5				0.00	49.09	0.00	3.8	
CN183	143.2	0.0098	0.013	Circle	2.5				40.55	49.09	40.55	3.8	9%
CN183	82.1	50.1335	0.013	Circle	2.5				2904.22	49.09	49.09	3.8	8%
CN183	175.3	0.0063	0.013	Circle	2.5				32.54	49.09	32.54	3.8	12%
CN183	39.2	-0.0023	0.013	Circle	2.5				0.00	49.09	0.00	3.8	
CN183	98.9	0.0193	0.013	Circle	2.5				57.01	49.09	49.09	3.8	8%
CN183b	26.3	0.0099	0.013	Circle	1				3.54	6.28	3.54	1.5	42%
CN183b	80.8	0.0233	0.013	Circle	1				5.43	6.28	5.43	1.5	28%
CN183b	43.8	0.0205	0.013	Circle	1				5.11	6.28	5.11	1.5	29%
CN183b	303.9	0.0098	0.013	Circle	1				3.52	6.28	3.52	1.5	43%
CN185	66.5	-0.0205	0.013	Circle	3				0.00	70.69	0.00	54.5	
CN185	181.4	0.0084	0.013	Circle	3				61.06	70.69	61.06	54.5	89%
CN185	90.0	0.0165	0.013	Circle	3				85.55	70.69	70.69	54.5	77%
CN185	44.1	0.0324	0.013	Circle	3				120.05	70.69	70.69	54.5	77%
CN185	93.3	0.0088	0.025	Trapezoid	0	1	1	3	78.22	120	78.22	54.5	70%
CN185	15.8	0.5891	0.013	Circle	3				511.94	70.69	70.69	54.5	77%
CN185	163.0	0.0085	0.013	Circle	3				61.59	70.69	61.59	54.5	88%
CN185	131.8	0.0032	0.013	Circle	3				37.65	70.69	37.65	54.5	145%
CN185	104.0	0.0125	0.013	Circle	3				74.58	70.69	70.69	54.5	77%
CN185	100.2	0.0434	0.013	Circle	2				47.13	25.13	25.13	54.5	217%
CN185	136.4	0.0228	0.013	Circle	2				34.16	25.13	25.13	54.5	217%
CN185	74.1	0.0085	0.013	Circle	2				20.86	25.13	20.86	54.5	261%
CN193	432.3	0.0037	0.024	Circle	2				7.48	25.13	7.48	15.1	202%
CN193	126.1	0.0007	0.024	Circle	2				3.27	25.13	3.27	15.1	461%
CN2	140.3	0.0115	0.013	Circle	1.25				6.92	9.82	6.92	30.8	445%
CN203	23.3	-0.0495	0.025	Trapezoid	0	1	1	3	0.00	120	0.00	5.2	
CN203	177.1	-0.0173	0.013	Circle	1.25				0.00	9.82	0.00	5.2	
CN203	115.9	0.0753	0.025	Trapezoid	0	1	1	3	228.90	120	228.90	5.2	2%
CN203	39.3	0.0610	0.024	Circle	2.5				54.87	49.09	49.09	5.2	11%
CN208	617.0	0.0021	0.013	Circle	1.25				2.99	9.82	2.99	4.5	151%
CN209	255.6	0.0334	0.013	Circle	1.5				19.21	14.14	14.14	14.1	100%
CN210	280.9	0.0357	0.013	Circle	4				271.57	125.66	125.66	61.7	49%
CN210	80.3	-0.0178	0.013	Circle	4				0.00	125.66	0.00	61.7	
CN210	55.8	0.1120	0.013	Circle	2				75.71	25.13	25.13	61.7	246%
CN210	58.9	0.1061	0.013	Circle	2				73.70	25.13	25.13	61.7	246%
CN210	12.2	0.0156	0.025	Trapezoid	0	0	0.5	2	8.68	16	8.68	61.7	711%
CN210	58.3	0.1072	0.013	Circle	2				74.08	25.13	25.13	61.7	246%
CN2101	137.0	0.0367	0.013	Circle	2				43.35	25.13	25.13	34.6	138%
CN2101	185.1	0.0083	0.013	Circle	2				20.63	25.13	20.63	34.6	168%
CN2101	269.6	0.0244	0.013	Circle	2				35.34	25.13	25.13	34.6	138%
CN2101	239.3	0.0292	0.013	Circle	2				38.66	25.13	25.13	34.6	138%
CN2101	146.7	0.0038	0.013	Circle	2				13.98	25.13	13.98	34.6	248%
CN2101	90.5	0.0423	0.013	Circle	2				46.53	25.13	25.13	34.6	138%
CN2101	89.8	0.0149	0.013	Circle	2				27.63	25.13	25.13	34.6	138%
CN2101	117.4	0.0092	0.013	Circle	2				21.70	25.13	21.70	34.6	159%
CN2101	230.5	0.0055	0.013	Circle	2				16.73	25.13	16.73	34.6	207%
CN2104	229.8	0.0064	0.013	Circle	1.5				8.37	14.14	8.37	12.7	152%
CN2104	264.5	0.0053	0.013	Circle	1.5				7.61	14.14	7.61	12.7	167%
CN2104	49.1	0.0241	0.024	Squash	0	2	1.5		12.82	18.85	12.82	12.7	99%
CN2104	347.5	0.0090	0.013	Circle	1.5				9.95	14.14	9.95	12.7	128%
CN2104	261.2	0.0034	0.013	Circle	1.5				6.13	14.14	6.13	12.7	207%
CN213	23.2	0.0022	0.013	Circle	3				30.95	70.69	30.95	236.7	765%
CN213	35.8	0.0039	0.013	Circle	5.5				210.03	237.58	210.03	236.7	113%
CN213	186.9	0.0014	0.025	Trapezoid	0	0	0	0	0.00	0	0.00	236.7	
CN217	47.3	-0.0102	0.024	Circle	2.5				0.00	49.09	0.00	33.9	

HMI_ID	Length	Slope	n	Shape	Diameter	Dim_1	Dim_2	Dim_3	$Cap_{Manning}$	Cap_{vel}	Capacity	Peak	% of Capacity
	ft	ft/ft			ft	ft	ft	h:v	cfs	cfs	cfs	cfs	
CN217	140.2	0.0017	0.024	Circle	2.5				9.19	49.09	9.19	33.9	369%
CN217	190.5	0.0044	0.024	Circle	2.5				14.66	49.09	14.66	33.9	231%
CN217	131.2	0.0130	0.024	Circle	3				41.12	70.69	41.12	33.9	82%
CN217	105.5	0.0044	0.024	Circle	2.5				14.67	49.09	14.67	33.9	231%
CN217	323.6	0.0001	0.013	Circle	2.5				3.95	49.09	3.95	33.9	858%
CN217	87.1	0.0001	0.013	Circle	2.5				4.39	49.09	4.39	33.9	772%
CN217	132.1	0.0002	0.024	Circle	3				5.44	70.69	5.44	33.9	623%
CN217	268.1	0.0068	0.013	Circle	2.5				33.89	49.09	33.89	33.9	100%
CN217	187.5	0.0085	0.024	Circle	3				33.38	70.69	33.38	33.9	102%
CN218	296.0	0.0136	0.024	Circle	2				14.30	25.13	14.30	37.7	264%
CN219	243.7	0.0796	0.013	Circle	1.25				18.23	9.82	9.82	13.4	136%
CN22	72.9	0.0176	0.024	Circle	1				2.56	6.28	2.56	5.0	196%
CN22	55.1	0.0162	0.024	Circle	1.25				4.45	9.82	4.45	5.0	112%
CN22	317.3	0.0070	0.024	Circle	1.25				2.93	9.82	2.93	5.0	170%
CN220	285.0	0.0579	0.013	Circle	1.25				15.54	9.82	9.82	13.4	136%
CN221	61.2	0.0579	0.013	Circle	1.5				25.27	14.14	14.14	13.4	95%
CN222	165.5	0.0036	0.013	Circle	2				13.62	25.13	13.62	28.6	210%
CN222	116.6	0.0036	0.013	Circle	2				13.58	25.13	13.58	28.6	211%
CN225	357.7	0.0036	0.013	Circle	2.5				24.63	49.09	24.63	28.2	114%
CN227	11.1	-0.0217	0.013	Circle	1.5				0.00	14.14	0.00	8.0	
CN227	256.2	0.0044	0.013	Circle	1.5				7.01	14.14	7.01	8.0	114%
CN227	13.1	-0.1204	0.013	Circle	1.5				0.00	14.14	0.00	8.0	
CN227	281.4	0.0108	0.013	Circle	1.5				10.94	14.14	10.94	8.0	73%
CN230	484.4	0.0049	0.013	Circle	1.25				4.51	9.82	4.51	12.8	284%
CN232	140.7	0.0050	0.024	Circle	3				25.49	70.69	25.49	66.4	261%
CN232	298.1	0.0067	0.013	Trapezoid	0	0	0	0	0.00	0	0.00	66.4	
CN232	44.2	0.0906	0.024	Circle	1				5.81	6.28	5.81	66.4	1143%
CN232	29.1	-0.1279	0.013	Circle	2				0.00	25.13	0.00	66.4	
CN232	158.8	0.0219	0.024	Squash	0	4.3333333	2.75		75.84	93.59	75.84	66.4	88%
CN233	319.2	0.0182	0.013	Circle	1.5				14.18	14.14	14.14	0.4	3%
CN234	355.3	0.0037	0.013	Circle	1.5				6.38	14.14	6.38	10.9	171%
CN234b	172.7	-0.0159	0.025	Trapezoid	0	0	0	0	0.00	0	0.00	11.2	
CN234b	84.1	0.0741	0.025	Trapezoid	0	8	1	6	3052.07	840	3052.07	11.2	0%
CN234b	7.3	0.1089	0.013	Rectangle	0	4	8		1462.35	320	320.00	11.2	4%
CN234b	28.8	-0.0827	0.013	Circle	1.5				0.00	14.14	0.00	11.2	
CN234b	52.1	0.1065	0.013	Circle	1.5				34.28	14.14	14.14	11.2	79%
CN248	13.5	-0.0245	0.013	Circle	3				0.00	70.69	0.00	37.9	
CN248	208.4	0.0042	0.013	Circle	3				43.35	70.69	43.35	37.9	87%
CN248	40.4	-0.0032	0.013	Circle	3				0.00	70.69	0.00	37.9	
CN248	238.1	0.0041	0.013	Circle	3				42.79	70.69	42.79	37.9	89%
CN248	215.4	0.0030	0.013	Circle	3				36.36	70.69	36.36	37.9	104%
CN250	84.6	0.0035	0.013	Circle	4.33				105.92	147.25	105.92	91.4	86%
CN255	63.5	0.0038	0.013	Circle	4.33				109.29	147.25	109.29	79.2	72%
CN255	402.1	0.0038	0.013	Circle	4.33				109.34	147.25	109.34	79.2	72%
CN255	78.6	0.0038	0.013	Circle	4.33				109.86	147.25	109.86	79.2	72%
CN255	212.1	0.0038	0.013	Circle	4.33				109.21	147.25	109.21	79.2	73%
CN256	16.3	-0.0135	0.013	Circle	2.5				0.00	49.09	0.00	25.0	
CN258	234.5	-0.0055	0.013	Circle	4.5				0.00	159.04	0.00	79.7	
CN259	6.2	1.0178	0	Circle	1				0.00	6.28	0.00	0.0	
CN259	430.3	0.0034	0.013	Circle	2.5				23.97	49.09	23.97	79.0	330%
CN260	87.7	0.0079	0.013	Circle	3				59.17	70.69	59.17	56.1	95%
CN260	72.0	0.0161	0.013	Rectangle	0	3.6666667	4		206.61	146.67	146.67	56.1	38%
CN260	44.2	0.0190	0.013	Circle	2.5				56.57	49.09	49.09	56.1	114%
CN260	235.0	0.0078	0.013	Circle	2				19.96	25.13	19.96	56.1	281%
CN260	14.3	0.0300	0.013	Circle	2.5				71.06	49.09	49.09	56.1	114%
CN260	169.8	0.0115	0.013	Circle	2.5				44.07	49.09	44.07	56.1	127%
CN260	8.3	0.0084	0.013	Circle	2.5				37.62	49.09	37.62	56.1	149%
CN260	45.6	0.0112	0.013	Circle	2.5				43.36	49.09	43.36	56.1	129%
CN260	14.2	-0.0147	0.013	Circle	2.5				0.00	49.09	0.00	56.1	
CN260	89.4	0.0217	0.013	Circle	2.5				60.42	49.09	49.09	56.1	114%
CN261	296.6	0.0124	0.024	Circle	1.25				3.90	9.82	3.90	2.5	64%
CN261	391.3	0.0263	0.013	Circle	1.25				10.47	9.82	9.82	2.5	25%
CN261	207.6	0.0078	0.024	Circle	1.25				3.08	9.82	3.08	2.5	81%
CN261	40.2	-0.0152	0.013	Circle	2.5				0.00	49.09	0.00	2.5	
CN261	398.4	0.0077	0.024	Circle	1.25				3.07	9.82	3.07	2.5	81%
CN261b	65.0	0.0240	0.013	Rectangle	0	1.25	1		9.43	10	9.43	8.4	89%
CN261b	15.4	-0.1032	0.013	Circle	1.25				0.00	9.82	0.00	8.4	
CN261b	248.1	0.0112	0.013	Circle	1.5				11.14	14.14	11.14	8.4	75%
CN261b	144.5	0.0054	0.025	Trapezoid	0	0	1	1.25	3.96	12.5	3.96	8.4	212%
CN261b	54.8	-0.0044	0.025	Trapezoid	0	0	1	1	0.00	8	0.00	8.4	
CN261b	159.9	0.0046	0.024	Circle	1.5				3.87	14.14	3.87	8.4	217%
CN261b	27.0	0.1095	0.024	Circle	1.25				11.58	9.82	9.82	8.4	86%
CN261b	105.8	0.0100	0.013	Circle	1.5				10.51	14.14	10.51	8.4	80%
CN261b	87.2	0.0081	0.013	Circle	1.25				5.83	9.82	5.83	8.4	144%
CN261b	49.6	-0.0201	0.025	Trapezoid	0	0	1	1.25	0.00	12.5	0.00	8.4	
CN261b	16.8	0.0084	0.013	Circle	1.25				5.91	9.82	5.91	8.4	142%

HMI_ID	Length	Slope	n	Shape	Diameter	Dim_1	Dim_2	Dim_3	$Cap_{Manning}$	Cap_{vel}	Capacity	Peak	% of Capacity
	ft	ft/ft			ft	ft	ft	h:v	cfs	cfs	cfs	cfs	
CN261b	67.7	0.0258	0.013	Circle	1.25				10.38	9.82	9.82	8.4	86%
CN261b	199.5	0.0056	0.013	Circle	1.25				4.82	9.82	4.82	8.4	174%
CN261b	65.6	0.0212	0.024	Circle	1.5				8.28	14.14	8.28	8.4	101%
CN261b	170.7	0.0104	0.013	Circle	1.25				6.60	9.82	6.60	8.4	127%
CN261b	233.0	0.0057	0.013	Circle	1.25				4.88	9.82	4.88	8.4	172%
CN261b	374.6	0.0108	0.013	Circle	1.5				10.92	14.14	10.92	8.4	77%
CN261b	70.0	-0.0284	0.013	Circle	2				0.00	25.13	0.00	8.4	
CN261b	109.6	0.0075	0.013	Circle	1.25				5.59	9.82	5.59	8.4	150%
CN261b	97.4	0.0140	0.013	Circle	1.5				12.41	14.14	12.41	8.4	68%
CN261b	160.3	0.0221	0.024	Circle	1.5				8.46	14.14	8.46	8.4	99%
CN261b	26.1	-0.0337	0.025	Trapezoid	0	0	1	1	0.00	8	0.00	8.4	
CN261b	134.0	0.0053	0.013	Circle	1.25				4.70	9.82	4.70	8.4	179%
CN261b	102.6	0.0096	0.024	Circle	1.5				5.59	14.14	5.59	8.4	150%
CN261b	69.9	0.0031	0.013	Circle	1.25				3.62	9.82	3.62	8.4	232%
CN261b	58.3	0.0139	0.013	Circle	1.5				12.38	14.14	12.38	8.4	68%
CN261b	41.4	0.0041	0.025	Trapezoid	0	0.02	0.66	1.25	2.00	8.45	2.00	8.4	420%
CN261b	106.4	0.0151	0.013	Circle	1.5				12.92	14.14	12.92	8.4	65%
CN261b	110.8	0.0431	0.024	Circle	1.5				11.82	14.14	11.82	8.4	71%
CN261b	149.7	0.0124	0.013	Circle	1.25				7.18	9.82	7.18	8.4	117%
CN261b	23.0	0.0283	0.013	Circle	1.25				10.87	9.82	9.82	8.4	86%
CN261b	60.2	-0.0046	0.013	Circle	2				0.00	25.13	0.00	8.4	
CN261b	25.3	0.0356	0.024	Squash	0	1.6666667	1.25		9.59	13.09	9.59	8.4	88%
CN261b	589.9	0.0103	0.025	Trapezoid	0	0.33	1	1.25	7.60	15.8	7.60	8.4	111%
CN261b	119.6	-0.0082	0.024	Circle	1.25				0.00	9.82	0.00	8.4	
CN261c	9.6	0.0229	0.013	Circle	1.75				23.99	19.24	19.24	22.2	115%
CN261c	88.3	0.0228	0.013	Circle	1.75				23.90	19.24	19.24	22.2	115%
CN261c	44.4	-0.0203	0.013	Circle	2				0.00	25.13	0.00	22.2	
CN261c	54.7	-0.0590	0.013	Circle	2				0.00	25.13	0.00	22.2	
CN261c	87.7	-0.0028	0.013	Circle	1.75				0.00	19.24	0.00	22.2	
CN261c	17.7	0.0277	0.013	Circle	2				37.65	25.13	25.13	22.2	88%
CN261d	166.7	0.0245	0.013	Circle	2.5				64.18	49.09	49.09	31.2	64%
CN261d	417.0	0.0074	0.013	Circle	2.5				35.36	49.09	35.36	31.2	88%
CN261d	15.7	-0.0740	0.013	Circle	2.5				0.00	49.09	0.00	31.2	
CN261d	400.2	0.0067	0.013	Circle	2.5				33.50	49.09	33.50	31.2	93%
CN261d	114.7	0.0019	0.013	Squash	0	3.0833333	2		17.24	38.75	17.24	31.2	181%
CN261d	47.7	0.0075	0.013	Circle	2.5				35.62	49.09	35.62	31.2	88%
CN262	225.7	0.0041	0.013	Circle	2.5				26.33	49.09	26.33	87.5	332%
CN263	143.1	0.0022	0.013	Circle	4				364.17	125.66	125.66	100.6	80%
CN263	58.2	0.0053	0.013	Circle	3				48.66	70.69	48.66	100.6	207%
CN263	15.6	-0.0051	0.013	Circle	4				0.00	125.66	0.00	100.6	
CN263	149.5	0.0109	0.025	Trapezoid	0	1	1	2	34.73	60	34.73	100.6	290%
CN263	79.3	0.0022	0.013	Circle	4				364.17	125.66	125.66	100.6	80%
CN264	92.4	0.0189	0.013	Circle	5				358.38	196.35	196.35	150.4	77%
CN264	432.8	0.0039	0.013	Circle	5				162.74	196.35	162.74	150.4	92%
CN265	460.7	0.0042	0.013	Circle	5				168.14	196.35	168.14	150.1	89%
CN266	302.4	0.0022	0.024	Circle	1.25				1.63	9.82	1.63	1.5	92%
CN267	66.2	0.0005	0.024	Circle	1.25				0.74	9.82	0.74	1.5	201%
CN270	524.3	0.0031	0.013	Circle	6				236.86	282.74	236.86	227.4	96%
CN271	230.7	0.0051	0.013	Circle	6				301.57	282.74	282.74	236.6	84%
CN272	336.0	0.0051	0.013	Circle	6				302.12	282.74	282.74	237.5	84%
CN273	135.6	-0.0195	0.024	Circle	2				0.00	25.13	0.00	27.8	
CN273	242.6	0.0083	0.024	Circle	2				11.18	25.13	11.18	27.8	249%
CN274	121.9	0.0062	0.024	Circle	2				9.61	25.13	9.61	47.3	492%
CN274	106.3	0.0280	0.024	Circle	2				20.52	25.13	20.52	47.3	231%
CN274	28.8	-0.0222	0.024	Circle	2				0.00	25.13	0.00	47.3	
CN274	55.8	0.0547	0.024	Circle	2				28.66	25.13	25.13	47.3	188%
CN275	33.3	0.0144	0.024	Circle	1.5				6.83	14.14	6.83	51.9	760%
CN275	24.3	0.0140	0.024	Circle	2				14.51	25.13	14.51	51.9	358%
CN275	344.6	0.0115	0.024	Circle	2				13.14	25.13	13.14	51.9	395%
CN275	244.5	0.0025	0.013	Circle	2				11.39	25.13	11.39	51.9	456%
CN276	138.7	0.0049	0.013	Circle	2				15.84	25.13	15.84	52.7	333%
CN276	487.5	0.0044	0.013	Circle	2				15.06	25.13	15.06	52.7	350%
CN278	67.2	-0.0001	0.013	Circle	2				0.00	25.13	0.00	71.7	
CN278	172.5	0.0013	0.013	Circle	2				8.08	25.13	8.08	71.7	888%
CN278	32.2	-0.0050	0.013	Circle	2				0.00	25.13	0.00	71.7	
CN279	267.8	0.0027	0.013	Circle	3				34.35	70.69	34.35	77.7	226%
CN279	297.2	0.0019	0.013	Circle	3				28.95	70.69	28.95	77.7	268%
CN279	52.8	0.0093	0.013	Circle	3				64.27	70.69	64.27	77.7	121%
CN280	15.0	0.0094	0.013	Circle	3				64.54	70.69	64.54	78.2	121%
CN280	331.5	0.0055	0.013	Circle	3				49.42	70.69	49.42	78.2	158%
CN280	358.6	0.0023	0.013	Circle	3				32.09	70.69	32.09	78.2	244%
CN281	93.4	0.0704	0.013	Circle	3				176.91	70.69	70.69	82.9	117%
CN281	70.1	0.0704	0.013	Circle	3				177.01	70.69	70.69	82.9	117%
CN281b	15.6	0.0281	0	Circle	0.5				0.00	1.57	0.00	0.0	
CN281b	7.0	-0.0029	0.013	Rectangle	0	4	1.6666667		0.00	66.67	0.00	14.4	
CN281b	72.9	-0.0044	0.024	Squash	0	2.5	1.5		0.00	23.56	0.00	14.4	

HMI_ID	Length	Slope	n	Shape	Diameter	Dim_1	Dim_2	Dim_3	$Cap_{Manning}$	Cap_{vel}	Capacity	Peak	% of Capacity
	ft	ft/ft			ft	ft	ft	h:v	cfs	cfs	cfs	cfs	
CN283	29.0	0.0028	0.013	Circle	2				11.89	25.13	11.89	1.8	15%
CN283	328.2	0.0037	0.013	Circle	2				13.74	25.13	13.74	1.8	13%
CN283	134.3	0.0156	0.013	Circle	2				28.22	25.13	25.13	1.8	7%
CN283	129.4	0.0027	0.013	Circle	2				11.76	25.13	11.76	1.8	15%
CN283	101.3	0.0154	0.013	Circle	2				28.07	25.13	25.13	1.8	7%
CN283	309.6	0.0109	0.013	Circle	2				23.57	25.13	23.57	1.8	8%
CN283	86.2	0.0028	0.013	Circle	2				11.94	25.13	11.94	1.8	15%
CN283	182.6	0.0027	0.013	Circle	2				11.72	25.13	11.72	1.8	15%
CN283	55.5	0.0052	0.013	Circle	2				16.35	25.13	16.35	1.8	11%
CN283	159.1	0.0129	0.013	Circle	2				25.74	25.13	25.13	1.8	7%
CN284	81.1	0.0079	0.013	Circle	2.5				36.43	49.09	36.43	6.0	16%
CN284	5.4	-0.2383	0.013	Circle	2				0.00	25.13	0.00	6.0	
CN284	56.4	0.0129	0.013	Circle	2.5				46.67	49.09	46.67	6.0	13%
CN284	261.0	0.0053	0.013	Circle	2.5				29.93	49.09	29.93	6.0	20%
CN285	21.8	0.0354	0.013	Circle	2.5				77.15	49.09	49.09	11.7	24%
CN285	335.1	0.0100	0.013	Circle	2.5				40.95	49.09	40.95	11.7	29%
CN285	391.5	0.0091	0.013	Circle	2.5				39.22	49.09	39.22	11.7	30%
CN286	61.4	0.0187	0.013	Circle	3				91.29	70.69	70.69	23.2	33%
CN286	266.1	0.0116	0.013	Circle	2.5				44.13	49.09	44.13	23.2	53%
CN289	187.4	0.0038	0.013	Circle	1				2.21	6.28	2.21	2.0	91%
CN289	81.3	0.0047	0.013	Circle	1				2.44	6.28	2.44	2.0	82%
CN289	69.2	0.0043	0.013	Circle	1				2.35	6.28	2.35	2.0	85%
CN289	138.0	0.0025	0.013	Circle	1				1.79	6.28	1.79	2.0	111%
CN289	196.8	0.0037	0.013	Circle	1				2.16	6.28	2.16	2.0	93%
CN289	83.2	-0.0002	0.013	Circle	1.25				0.00	9.82	0.00	2.0	
CN289	144.8	0.0056	0.013	Circle	1.25				4.83	9.82	4.83	2.0	41%
CN289	383.8	0.0008	0.013	Circle	1.5				2.89	14.14	2.89	2.0	69%
CN289	180.4	0.0102	0.013	Circle	1				3.60	6.28	3.60	2.0	56%
CN289	456.0	0.0018	0.013	Circle	1.25				2.72	9.82	2.72	2.0	73%
CN289	170.0	0.0113	0.013	Circle	1				3.79	6.28	3.79	2.0	53%
CN290	179.4	0.0040	0.013	Circle	1.25				4.09	9.82	4.09	4.6	112%
CN290	65.6	0.0035	0.013	Circle	1.17				3.18	8.6	3.18	4.6	145%
CN290	147.7	0.0047	0.013	Circle	1.25				4.42	9.82	4.42	4.6	104%
CN290	401.4	0.0047	0.013	Circle	1.25				4.41	9.82	4.41	4.6	104%
CN290	147.8	0.0009	0.013	Circle	1.25				1.92	9.82	1.92	4.6	240%
CN290	380.9	0.0047	0.013	Circle	1.25				4.42	9.82	4.42	4.6	104%
CN290	110.2	0.0236	0.013	Circle	1.25				9.92	9.82	9.82	4.6	47%
CN290	212.8	0.0040	0.013	Circle	1.25				4.11	9.82	4.11	4.6	112%
CN290	54.6	0.0238	0.013	Circle	0				0.00	0	0.00	4.6	
CN292	859.1	0.0023	0.025	Trapezoid	0	0	1	2	9.01	32	9.01	1.2	13%
CN293	21.0	-0.0052	0.024	Circle	2.5				0.00	49.09	0.00	1.2	
CN293	247.7	0.0193	0.025	Trapezoid	0	0	1	2.5	47.57	62.5	47.57	1.2	3%
CN293	630.8	0.0019	0.013	Circle	3				29.09	70.69	29.09	1.2	4%
CN293	120.1	0.0230	0.025	Trapezoid	0	1	1	2	50.45	60	50.45	1.2	2%
CN293	78.2	0.0174	0.025	Trapezoid	0	0	1	2.5	45.11	62.5	45.11	1.2	3%
CN294	166.7	0.0020	0.024	Circle	1.25				1.56	9.82	1.56	6.8	437%
CN294	117.7	0.0151	0.024	Circle	1.25				4.30	9.82	4.30	6.8	158%
CN294	250.2	0.0038	0.024	Circle	1.25				2.14	9.82	2.14	6.8	317%
CN294	92.6	0.0861	0.024	Circle	1.25				10.27	9.82	9.82	6.8	69%
CN297	262.8	0.0038	0.013	Circle	5.5				208.17	237.58	208.17	237.9	114%
CN298	61.9	0.0078	0.013	Circle	2.5				36.12	49.09	36.12	25.0	69%
CN298	65.4	0.0076	0.013	Circle	2.5				35.85	49.09	35.85	25.0	70%
CN298	74.1	-0.0381	0.013	Circle	3				0.00	70.69	0.00	25.0	
CN298	106.8	0.0158	0.013	Circle	2				28.46	25.13	25.13	25.0	99%
CN298	101.0	0.0306	0.013	Circle	2				39.56	25.13	25.13	25.0	99%
CN298	45.7	0.0306	0.013	Circle	2				39.58	25.13	25.13	25.0	99%
CN299	176.9	0.0032	0.013	Circle	3				37.53	70.69	37.53	27.3	73%
CN299	76.1	0.0034	0.013	Circle	3				38.99	70.69	38.99	27.3	70%
CN299	155.5	0.0004	0.013	Circle	1.5				2.06	14.14	2.06	27.3	1323%
CN299	73.1	0.0036	0.013	Circle	3				39.79	70.69	39.79	27.3	69%
CN299	119.0	0.0035	0.013	Circle	3				39.63	70.69	39.63	27.3	69%
CN3	73.1	0.0070	0.013	Circle	2.5				34.27	49.09	34.27	16.1	47%
CN3	29.1	0.0065	0.013	Circle	0				0.00	0	0.00	16.1	
CN3	75.9	0.0493	0.024	Circle	2				27.20	25.13	25.13	16.1	64%
CN3	255.6	0.0086	0.013	Circle	2.5				38.05	49.09	38.05	16.1	42%
CN3	11.8	0.1041	0.013	Circle	2.5				132.32	49.09	49.09	16.1	33%
CN3	51.0	0.0128	0.013	Circle	2.5				46.33	49.09	46.33	16.1	35%
CN3	133.0	0.0166	0.013	Circle	2.5				52.88	49.09	49.09	16.1	33%
CN3	18.7	-0.0107	0.013	Circle	2.5				0.00	49.09	0.00	16.1	
CN3	84.1	0.0225	0.013	Circle	2.5				61.50	49.09	49.09	16.1	33%
CN3	100.8	0.0420	0.013	Circle	2				46.34	25.13	25.13	16.1	64%
CN3	80.1	0.0337	0.013	Circle	2.5				75.32	49.09	49.09	16.1	33%
CN3	58.2	0.0101	0.024	Circle	2				12.33	25.13	12.33	16.1	131%
CN3	71.0	0.0602	0.013	Circle	2				55.49	25.13	25.13	16.1	64%
CN3	30.2	-0.0106	0.013	Circle	2				0.00	25.13	0.00	16.1	
CN3	65.2	0.0061	0.013	Circle	2.5				32.13	49.09	32.13	16.1	50%

HMI_ID	Length	Slope	n	Shape	Diameter	Dim_1	Dim_2	Dim_3	$Cap_{Manning}$	Cap_{vel}	Capacity	Peak	% of Capacity
	ft	ft/ft			ft	ft	ft	h:v	cfs	cfs	cfs	cfs	
CN3	336.6	0.0175	0.013	Circle	1.25				8.54	9.82	8.54	16.1	188%
CN3	339.0	0.0086	0.013	Circle	2.5				38.13	49.09	38.13	16.1	42%
CN301	28.5	-0.0028	0.013	Circle	1.5				0.00	14.14	0.00	33.0	
CN301	97.7	-0.0316	0.024	Circle	2				0.00	25.13	0.00	33.0	
CN301	137.4	0.0055	0.013	Circle	2				16.71	25.13	16.71	33.0	197%
CN304	101.2	0.0075	0.024	Circle	4				67.41	125.66	67.41	0.0	0%
CN304	156.8	0.0383	0.024	Circle	3				70.73	70.69	70.69	0.0	0%
CN306	544.8	-0.0028	0.024	Circle	4				0.00	125.66	0.00	32.1	
CN306	390.3	0.0144	0.024	Circle	4				93.44	125.66	93.44	32.1	34%
CN306	30.4	0.0109	0.024	Circle	4				81.10	125.66	81.10	32.1	40%
CN306	109.8	0.0185	0.024	Circle	4				105.80	125.66	105.80	32.1	30%
CN306	27.5	0.1013	0.025	Trapezoid	0	0	9	2	678.22	360	678.22	32.1	5%
CN306	326.9	0.0332	0.025	Trapezoid	0	0	9	2	388.5	360	388.50	32.1	8%
CN306	308.0	-0.0049	0.024	Circle	4				0.00	125.66	0.00	32.1	
CN306	345.5	-0.0028	0.024	Circle	4				0.00	125.66	0.00	32.1	
CN308	111.6	0.0116	0.013	Circle	1.25				6.97	9.82	6.97	5.6	80%
CN308	54.3	-0.0004	0.013	Circle	2				0.00	25.13	0.00	5.6	
CN308	114.1	0.0048	0.013	Circle	1.25				4.48	9.82	4.48	5.6	125%
CN308	62.3	0.0101	0.024	Circle	1.25				3.52	9.82	3.52	5.6	159%
CN308	92.1	0.0015	0.013	Circle	2				8.82	25.13	8.82	5.6	63%
CN309	25.7	0.0128	0.013	Circle	5.5				380.57	237.58	237.58	15.6	7%
CN309	80.6	0.0770	0.013	Circle	2				62.78	25.13	25.13	15.6	62%
CN309	35.0	0.2121	0.013	Circle	2				104.20	25.13	25.13	15.6	62%
CN309	169.7	0.0028	0.013	Circle	2				12.03	25.13	12.03	15.6	130%
CN310	82.6	0.0038	0.013	Circle	2				13.86	25.13	13.86	15.8	114%
CN310	205.3	0.0009	0.013	Circle	2				6.70	25.13	6.70	15.8	236%
CN310	90.6	-0.0543	0.013	Circle	2				0.00	25.13	0.00	15.8	
CN3101	394.0	0.0078	0.013	Circle	1.75				14.03	19.24	14.03	50.9	363%
CN3101	7.7	-0.0039	0.013	Circle	1.75				0.00	19.24	0.00	50.9	
CN3101	351.6	0.0033	0.013	Circle	2				12.94	25.13	12.94	50.9	393%
CN3104	29.1	0.0415	0.024	Circle	2.5				45.27	49.09	45.27	24.2	53%
CN3104	86.7	0.0417	0.024	Circle	2.5				45.34	49.09	45.34	24.2	53%
CN3104	10.8	0.0000	0	Circle	0				0.00	0	0.00	0.0	
CN3105	134.9	0.0027	0.013	Circle	1.75				8.19	19.24	8.19	48.3	590%
CN3105	48.7	0.0090	0	Circle	1.25				0.00	9.82	0.00	0.0	
CN3105	292.5	0.0099	0.013	Circle	0.5				0.56	1.57	0.56	48.3	8645%
CN3105	216.1	0.0037	0.013	Circle	1.75				9.64	19.24	9.64	48.3	501%
CN3105	15.7	0.0121	0.013	Circle	0.5				0.62	1.57	0.62	48.3	7813%
CN3105	52.7	0.0184	0.013	Circle	1.25				8.76	9.82	8.76	48.3	551%
CN311	124.6	0.0063	0.024	Circle	1.5				4.53	14.14	4.53	0.0	0%
CN311	91.6	-0.0044	0.024	Circle	1.5				0.00	14.14	0.00	0.0	
CN311	125.1	0.0028	0.024	Trapezoid	0	0	0.7	2.5	11.48	35	11.48	0.0	0%
CN311	115.1	0.0124	0.024	Circle	1.5				6.34	14.14	6.34	0.0	0%
CN312	14.6	-0.1238	0.025	Trapezoid	0	0	0.75	4	0.00	120	0.00	2.2	
CN312	321.0	0.0425	0.013	Circle	3				137.50	70.69	70.69	2.2	3%
CN312	92.6	-0.0644	0.013	Circle	3				0.00	70.69	0.00	2.2	
CN313	451.9	0.0016	0.013	Circle	4.5				78.49	159.04	78.49	78.8	100%
CN313	396.8	0.0051	0.013	Circle	4.5				140.30	159.04	140.30	78.8	56%
CN315	100.1	-0.0185	0.013	Circle	2.5				0.00	49.09	0.00	5.2	
CN315	108.0	-0.0046	0.013	Circle	2.5				0.00	49.09	0.00	5.2	
CN315	349.1	0.0052	0.013	Circle	2				16.38	25.13	16.38	5.2	32%
CN315	15.7	0.0064	0.025	Trapezoid	0	0	0.75	4	64.37	120	64.37	5.2	8%
CN315	51.2	0.0411	0.013	Circle	2.5				83.10	49.09	49.09	5.2	11%
CN315	219.1	0.0345	0.013	Circle	2.5				76.14	49.09	49.09	5.2	11%
CN315	189.7	0.0345	0.013	Circle	2.5				76.21	49.09	49.09	5.2	11%
CN317	10.3	0.0077	0.013	Circle	3				58.66	70.69	58.66	39.9	68%
CN317	74.2	0.0049	0.013	Circle	3				46.47	70.69	46.47	39.9	86%
CN317	74.6	0.0079	0.013	Circle	3				59.30	70.69	59.30	39.9	67%
CN317	66.6	0.0053	0.013	Circle	3				48.35	70.69	48.35	39.9	83%
CN317	63.8	0.0086	0.013	Circle	3				61.90	70.69	61.90	39.9	64%
CN317	139.5	0.0085	0.013	Circle	3				61.34	70.69	61.34	39.9	65%
CN317	158.6	0.0106	0.013	Circle	3				68.65	70.69	68.65	39.9	58%
CN317	106.0	0.0091	0.013	Circle	3				63.48	70.69	63.48	39.9	63%
CN319	154.3	-0.0008	0.013	Circle	2				0.00	25.13	0.00	6.2	
CN319	35.7	0.1955	0.013	Circle	2				100.02	25.13	25.13	6.2	25%
CN320	242.6	0.0021	0.013	Circle	3				30.28	70.69	30.28	27.3	90%
CN320	200.6	0.0011	0.013	Circle	2.5				13.89	49.09	13.89	27.3	197%
CN320	249.1	0.0036	0.013	Circle	2.5				24.65	49.09	24.65	27.3	111%
CN320	212.5	0.0041	0.013	Circle	3				42.68	70.69	42.68	27.3	64%
CN320	116.8	0.0087	0.013	Circle	2.5				38.33	49.09	38.33	27.3	71%
CN320	25.7	0.0576	0.013	Circle	2				54.29	25.13	25.13	27.3	109%
CN320	121.4	-0.0007	0.013	Circle	2				0.00	25.13	0.00	27.3	
CN320	24.8	0.0056	0.013	Circle	2.5				30.83	49.09	30.83	27.3	89%
CN320	35.4	0.0088	0.013	Circle	2.5				38.38	49.09	38.38	27.3	71%
CN3203	280.1	0.0079	0.013	Circle	2				20.09	25.13	20.09	7.5	37%
CN3203	246.0	0.0010	0.013	Circle	2				7.21	25.13	7.21	7.5	104%

HMI_ID	Length	Slope	n	Shape	Diameter	Dim_1	Dim_2	Dim_3	$Cap_{Manning}$	Cap_{vel}	Capacity	Peak	% of Capacity
	ft	ft/ft			ft	ft	ft	h:v	cfs	cfs	cfs	cfs	
CN3203	213.2	0.0135	0.013	Circle	2				26.25	25.13	25.13	7.5	30%
CN3203b	90.8	0.0537	0.013	Circle	2				52.44	25.13	25.13	42.6	170%
CN3203b	3.4	-0.1861	0.013	Rectangle	0	5	4		0.00	200	0.00	42.6	
CN3204	141.3	-0.0004	0.024	Circle	3				0.00	70.69	0.00	0.0	
CN3204	62.0	0.0568	0.024	Squash	0	2.8333333	2		45.78	35.6	35.60	0.0	0%
CN3204	80.6	0.0120	0.013	Circle	1.5				11.52	14.14	11.52	0.0	0%
CN3204	161.6	0.0019	0.013	Trapezoid	0	0	0.875	2	12.39	28	12.39	0.0	0%
CN3204	144.6	0.0009	0.024	Circle	3				10.83	70.69	10.83	0.0	0%
CN3204	44.5	-0.0447	0.013	Circle	1.5				0.00	14.14	0.00	0.0	
CN3204	139.0	-0.0037	0.024	Circle	3				0.00	70.69	0.00	0.0	
CN3204	316.0	-0.0003	0.013	Trapezoid	0	0	0.875	2	0.00	28	0.00	0.0	
CN3204	605.4	0.0144	0.024	Squash	0	3.3333333	2.3333333		35.09	61.09	35.09	0.0	0%
CN3204	101.1	0.0107	0.024	Circle	3				37.34	70.69	37.34	0.0	0%
CN3204	172.3	0.0024	0.013	Circle	1.5				5.19	14.14	5.19	0.0	0%
CN3204	91.8	-0.0105	0.013	Circle	2				0.00	25.13	0.00	0.0	
CN3204	98.3	0.0060	0.013	Circle	1.5				8.14	14.14	8.14	0.0	0%
CN3205	78.5	0.0483	0.024	Circle	2				26.92	25.13	25.13	4.6	18%
CN3205	292.8	0.0041	0.024	Circle	2				7.88	25.13	7.88	4.6	58%
CN3205	66.1	0.0048	0.024	Circle	2				8.52	25.13	8.52	4.6	54%
CN3205	43.0	0.0697	0.024	Circle	2				32.36	25.13	25.13	4.6	18%
CN3205	140.2	0.0106	0.024	Circle	2				12.63	25.13	12.63	4.6	36%
CN3205	124.6	0.0200	0.024	Circle	2				17.32	25.13	17.32	4.6	27%
CN3205	294.1	0.0172	0.024	Circle	2.5				29.11	49.09	29.11	4.6	16%
CN3205	20.3	0.0359	0.024	Circle	2.5				42.12	49.09	42.12	4.6	11%
CN3205	111.9	0.0300	0.024	Circle	2				21.24	25.13	21.24	4.6	22%
CN3205	296.8	0.0000	0.024	Circle	2.5				0.00	49.09	0.00	4.6	
CN321	804.2	0.0105	0.013	Circle	1.5				10.78	14.14	10.78	13.9	129%
CN322	547.4	0.0335	0.013	Circle	1.5				19.21	14.14	14.14	6.1	43%
CN322	199.1	0.0335	0.013	Circle	1.5				19.21	14.14	14.14	6.1	43%
CN322	26.9	0.0026	0.013	Circle	1.25				3.30	9.82	3.30	6.1	185%
CN322	249.6	0.0038	0.013	Circle	1.5				6.45	14.14	6.45	6.1	95%
CN322	265.2	0.0334	0.013	Circle	1.5				19.21	14.14	14.14	6.1	43%
CN324	167.3	0.1756	0.013	Circle	1.5				44.02	14.14	14.14	8.3	59%
CN325	53.7	0.1687	0.025	Trapezoid	0	3	1	1.5	157.24	67.5	157.24	4.1	3%
CN325	82.3	0.0028	0.025	Trapezoid	0	3	1	1.5	20.23	67.5	20.23	4.1	20%
CN325	66.2	-0.0331	0.013	Circle	2				0.00	25.13	0.00	4.1	
CN325	92.8	-0.0053	0.025	Trapezoid	0	3	1	1.5	0.00	67.5	0.00	4.1	
CN325	28.2	0.0873	0.024	Circle	2				36.20	25.13	25.13	4.1	16%
CN325	138.8	0.0095	0.013	Circle	1.25				6.30	9.82	6.30	4.1	65%
CN325	21.5	-0.0019	0.013	Rectangle	0	4	2.1666667		0.00	86.67	0.00	4.1	
CN325	29.1	0.0175	0.024	Circle	2				16.23	25.13	16.23	4.1	25%
CN325b	1527.6	0.0063	0.013	Trapezoid	0	0.33	1	2.33	42.21	61.98	42.21	17.4	41%
CN325b	181.7	0.0073	0.024	Circle	1.25				2.98	9.82	2.98	17.4	583%
CN325b	32.2	-0.0510	0.024	Circle	1.25				0.00	9.82	0.00	17.4	
CN326	235.8	0.1003	0.013	Circle	1.25				20.46	9.82	9.82	4.1	42%
CN326	53.6	-0.0021	0.013	Circle	1.25				0.00	9.82	0.00	4.1	
CN326	11.1	0.0217	0.013	Circle	1.25				9.51	9.82	9.51	4.1	43%
CN326	166.7	0.0367	0.013	Circle	1.25				12.37	9.82	9.82	4.1	42%
CN328	167.4	0.0124	0.013	Circle	1.25				7.20	9.82	7.20	5.6	78%
CN328	169.5	0.0067	0.013	Circle	1.5				8.58	14.14	8.58	5.6	65%
CN328	132.5	0.0016	0.013	Circle	2				9.00	25.13	9.00	5.6	62%
CN329	118.9	0.0039	0.013	Circle	0				0.00	0	0.00	1.7	
CN329	35.3	-0.0023	0.013	Circle	0				0.00	0	0.00	1.7	
CN329	400.4	-0.0021	0.013	Circle	1.5				0.00	14.14	0.00	1.7	
CN329	355.1	0.0012	0.013	Circle	1.5				3.57	14.14	3.57	1.7	48%
CN331	51.4	0.0072	0.013	Circle	4.33				150.86	147.25	147.25	141.3	96%
CN331	65.7	0.0073	0.013	Circle	4.33				151.97	147.25	147.25	141.3	96%
CN331	93.9	0.0095	0.013	Rectangle	0	9	4.3333333		559.16	390	390.00	141.3	36%
CN331	17.1	0.0094	0.013	Rectangle	0	9	3.3333333		378.22	300	300.00	141.3	47%
CN331	89.3	-0.0102	0.013	Circle	4.5				0.00	159.04	0.00	141.3	
CN331	89.8	0.0035	0.013	Circle	4.33				104.50	147.25	104.50	141.3	135%
CN336	24.8	0.0230	0.025	Trapezoid	0	0.2	1.2	2	41.24	52	41.24	15.8	38%
CN336	8.7	0.0081	0.013	Circle	2				20.32	25.13	20.32	15.8	78%
CN336	410.3	0.0214	0.025	Trapezoid	0	2	1	2	71.58	80	71.58	15.8	22%
CN336	176.0	0.0059	0.013	Circle	2				17.39	25.13	17.39	15.8	91%
CN336	45.0	0.0522	0.024	Circle	2				28.01	25.13	25.13	15.8	63%
CN337	233.8	0.0040	0.013	Circle	2				14.34	25.13	14.34	10.4	73%
CN337	197.1	-0.0019	0.013	Circle	2				0.00	25.13	0.00	6.9	
CN337	146.7	0.0075	0.013	Circle	2				19.59	25.13	19.59	6.9	35%
CN337	71.6	0.0228	0.013	Circle	2				34.13	25.13	25.13	6.9	27%
CN337	190.9	0.0266	0.013	Circle	2				36.90	25.13	25.13	6.9	27%
CN339	152.6	0.0058	0.013	Rectangle	0	9	4.3333333		436.19	390	390.00	156.9	40%
CN339	18.6	0.0011	0.013	Circle	5				85.47	196.35	85.47	156.9	184%
CN339	14.0	0.3681	0.013	Rectangle	0	4.5833333	4.1666667		1403.82	190.97	190.97	156.9	82%
CN339	169.2	0.0013	0.013	Circle	5				93.91	196.35	93.91	156.9	167%
CN339	80.6	0.0072	0.013	Circle	5				220.87	196.35	196.35	156.9	80%

HMI_ID	Length	Slope	n	Shape	Diameter	Dim_1	Dim_2	Dim_3	$Cap_{Manning}$	Cap_{vel}	Capacity	Peak	% of Capacity
	ft	ft/ft			ft	ft	ft	h:v	cfs	cfs	cfs	cfs	
CN339	592.2	0.0085	0.013	Circle	5				240.03	196.35	196.35	156.9	80%
CN343	4.7	0.0385	0.013	Rectangle	0	4	3		242.86	120	120.00	9.1	8%
CN343	57.1	0.0119	0.013	Circle	1.25				7.05	9.82	7.05	9.1	129%
CN343	57.3	0.0185	0.013	Circle	1.25				8.79	9.82	8.79	9.1	104%
CN343	67.9	0.0793	0.013	Circle	1.25				18.19	9.82	9.82	9.1	93%
CN343	175.8	0.0135	0.013	Circle	1.25				7.52	9.82	7.52	9.1	121%
CN343	306.9	0.0063	0.013	Circle	1.25				5.12	9.82	5.12	9.1	178%
CN344	75.8	-0.0102	0.013	Circle	2				0.00	25.13	0.00	13.4	
CN344	357.0	-0.0103	0.013	Circle	2				0.00	25.13	0.00	13.4	
CN344	74.3	-0.0214	0.013	Circle	1.25				0.00	9.82	0.00	13.4	
CN345	49.0	0.0069	0.024	Circle	2				10.18	25.13	10.18	8.3	82%
CN345	204.0	0.0036	0.024	Circle	1.25				2.09	9.82	2.09	8.3	396%
CN345	385.3	-0.0221	0.013	Circle	0				0.00	0	0.00	8.3	
CN345	108.0	0.0375	0.013	Circle	0				0.00	0	0.00	8.3	
CN345	116.3	0.0126	0.013	Circle	0				0.00	0	0.00	8.3	
CN345	93.9	0.0867	0.013	Circle	0.5				1.65	1.57	1.57	8.3	529%
CN345	73.6	0.0196	0.013	Circle	2				31.65	25.13	25.13	8.3	33%
CN348	170.7	0.0003	0.024	Circle	2				2.10	25.13	2.10	27.3	1302%
CN348	246.8	0.0036	0.024	Circle	2				7.36	25.13	7.36	27.3	371%
CN348	36.0	-0.0477	0.024	Circle	2				0.00	25.13	0.00	27.3	
CN348	78.1	0.0046	0.024	Circle	2				8.32	25.13	8.32	27.3	328%
CN348	49.9	-0.0072	0.024	Circle	2				0.00	25.13	0.00	27.3	
CN348	54.1	0.0272	0.013	Circle	2				37.31	25.13	25.13	27.3	109%
CN348	140.9	0.0121	0.013	Circle	1.5				11.57	14.14	11.57	27.3	236%
CN348	33.0	0.0036	0.024	Circle	2				7.39	25.13	7.39	27.3	370%
CN348	98.2	0.0056	0.013	Circle	1.5				7.86	14.14	7.86	27.3	347%
CN349	73.9	0.0093	0.013	Circle	6				409.12	282.74	282.74	220.5	78%
CN349	309.2	0.0045	0.013	Circle	6				285.00	282.74	282.74	220.5	78%
CN350	182.8	0.0036	0.013	Circle	6				254.50	282.74	254.50	225.1	88%
CN350	469.4	0.0031	0.013	Circle	6				237.00	282.74	237.00	225.1	95%
CN351	68.6	0.1393	0.013	Circle	1.5				39.20	14.14	14.14	3.7	26%
CN352	137.2	0.0023	0.013	Circle	6				201.34	282.74	201.34	230.6	115%
CN352	223.8	0.0125	0.013	Circle	6				472.89	282.74	282.74	230.6	82%
CN353	101.2	0.0019	0.024	Circle	3.5				23.62	96.21	23.62	13.7	58%
CN353	86.6	-0.0040	0.013	Circle	2.5				0.00	49.09	0.00	13.7	
CN353	379.6	0.0103	0.013	Rectangle	0	6.6666667	1.5		83.76	100	83.76	13.7	16%
CN353	78.5	0.0130	0.013	Rectangle	0	14	2		333.75	280	280.00	13.7	5%
CN353	43.8	0.0005	0.024	Circle	3.5				11.64	96.21	11.64	13.7	118%
CN353	387.3	-0.0041	0.013	Circle	2.5				0.00	49.09	0.00	13.7	
CN354	36.8	0.0638	0.013	Circle	2.5				103.58	49.09	49.09	20.4	42%
CN354	155.8	-0.0003	0.013	Circle	2.5				0.00	49.09	0.00	20.4	
CN354	173.3	0.0088	0.013	Rectangle	0	4	2		65.57	80	65.57	20.4	31%
CN354	221.8	0.0040	0.013	Rectangle	0	3.3333333	1.5		23.20	50	23.20	20.4	88%
CN354	39.1	0.0038	0.013	Rectangle	0	3.3333333	1.5		22.82	50	22.82	20.4	89%
CN354	68.1	0.0090	0.013	Rectangle	0	3.6666667	2		59.36	73.33	59.36	20.4	34%
CN354	228.9	0.0088	0.013	Rectangle	0	3.6666667	2		58.90	73.33	58.90	20.4	35%
CN354	290.7	0.0088	0.013	Rectangle	0	3.6666667	2		58.85	73.33	58.85	20.4	35%
CN355	27.4	-0.0971	0.013	Circle	3				0.00	70.69	0.00	102.1	
CN355	61.7	-0.0126	0.013	Circle	3				0.00	70.69	0.00	102.1	
CN355	137.9	0.0032	0.013	Circle	3				37.67	70.69	37.67	102.1	271%
CN355	140.5	0.0110	0.013	Circle	3				70.05	70.69	70.05	102.1	146%
CN355	181.8	0.0167	0.013	Circle	3				86.10	70.69	70.69	102.1	144%
CN356	153.8	0.0328	0.024	Circle	1.25				6.33	9.82	6.33	23.8	376%
CN356	254.6	0.0117	0.025	Trapezoid	0	3.5	1	1.25	34.15	59.38	34.15	23.8	70%
CN356	73.5	-0.0105	0.025	Trapezoid	0	3.5	1	0	0.00	0	0.00	23.8	
CN356	238.6	0.0024	0.025	Trapezoid	0	3.5	1	1.25	13.70	59.38	13.70	23.8	174%
CN356	292.6	0.0136	0.025	Trapezoid	0	3.5	1	1.25	32.35	59.38	32.35	23.8	74%
CN356	22.2	-0.0018	0.024	Circle	1.25				0.00	9.82	0.00	23.8	
CN358	390.4	0.0259	0.013	Circle	2.25				49.81	31.81	31.81	10.9	34%
CN358	110.5	0.0030	0.013	Circle	2.25				16.92	31.81	16.92	10.9	64%
CN358	157.8	-0.0035	0.013	Circle	2.25				0.00	31.81	0.00	10.9	
CN358	5.3	0.0019	0.013	Rectangle	0	4.5	3		62.39	135	62.39	10.9	17%
CN359	206.0	-0.0076	0.013	Circle	2.25				22.00	31.81	22.00	25.2	115%
CN359	130.1	-0.0317	0.024	Circle	2.5				18.00	49.09	18.00	25.2	140%
CN360	116.7	0.0242	0.013	Circle	2.5				63.77	49.09	49.09	31.5	64%
CN360	213.3	0.0020	0.013	Circle	3				29.95	70.69	29.95	31.5	105%
CN360	188.7	0.0252	0.013	Circle	3				105.93	70.69	70.69	31.5	45%
CN360	271.3	0.0049	0.013	Circle	3				46.52	70.69	46.52	31.5	68%
CN361	72.2	-0.0119	0.025	Trapezoid	0	0	0.6	1.67	0.00	13.39	0.00	6.4	
CN361	303.5	0.0034	0.024	Circle	1.25				2.04	9.82	2.04	6.4	314%
CN361	25.9	0.0545	0.013	Circle	2				52.82	25.13	25.13	6.4	25%
CN361	271.1	0.0069	0.024	Circle	1.25				2.91	9.82	2.91	6.4	220%
CN361	18.1	-0.0912	0.024	Circle	1.25				0.00	9.82	0.00	6.4	
CN361	379.7	0.0139	0.025	Trapezoid	0	0	0.6	1.67	6.67	13.39	6.67	6.4	96%
CN361	125.3	-0.0022	0.013	Circle	2				0.00	25.13	0.00	6.4	
CN361	30.3	0.0542	0.013	Circle	2				52.65	25.13	25.13	6.4	25%

HMI_ID	Length	Slope	n	Shape	Diameter	Dim_1	Dim_2	Dim_3	$Cap_{Manning}$	Cap_{vel}	Capacity	Peak	% of Capacity
	ft	ft/ft			ft	ft	ft	h:v	cfs	cfs	cfs	cfs	
CN361	17.9	0.0630	0.013	Circle	2				56.80	25.13	25.13	6.4	25%
CN362	189.5	0.0461	0.013	Circle	2				48.55	25.13	25.13	27.4	109%
CN362	118.4	0.0260	0.013	Circle	2				36.49	25.13	25.13	27.4	109%
CN362	193.0	0.0027	0.013	Circle	2.5				21.29	49.09	21.29	27.4	129%
CN362	185.8	0.0003	0.013	Circle	2.5				7.37	49.09	7.37	27.4	372%
CN362	320.4	0.0261	0.013	Circle	2				36.52	25.13	25.13	27.4	109%
CN362	35.7	0.0594	0.013	Circle	2				55.14	25.13	25.13	27.4	109%
CN362	12.5	-0.0184	0.013	Rectangle	0	3.5	3.8333333		0.00	134.17	0.00	27.4	
CN366	126.1	-0.0030	0.013	Circle	6				0.00	282.74	0.00	236.5	
CN366	78.0	-0.0049	0.013	Circle	6				0.00	282.74	0.00	236.5	
CN367	469.4	0.0006	0.013	Circle	3				16.00	70.69	16.00	43.0	269%
CN367	33.1	0.0021	0.013	Circle	2.5				18.85	49.09	18.85	43.0	228%
CN367	25.8	-0.1462	0.013	Circle	3				0.00	70.69	0.00	43.0	
CN367	63.4	0.0805	0.013	Circle	3				189.21	70.69	70.69	43.0	61%
CN368	59.2	0.0145	0.025	Trapezoid	0	4	1	1	29.10	50	29.10	39.5	136%
CN368	122.8	0.0239	0.025	Trapezoid	0	4	1	1	37.35	50	37.35	39.5	106%
CN368	19.1	0.0073	0.024	Circle	2				10.49	25.13	10.49	39.5	376%
CN368	352.3	-0.0047	0.025	Trapezoid	0	4	1	1	0.00	50	0.00	39.5	
CN368	204.8	0.0066	0.025	Trapezoid	0	1	1	2	27.12	60	27.12	39.5	146%
CN368	5.3	-0.0836	0.025	Trapezoid	0	4	1	1	0.00	50	0.00	39.5	
CN368	11.2	0.0329	0.024	Circle	2				22.23	25.13	22.23	39.5	178%
CN368	51.1	0.0070	0.025	Trapezoid	0	4	1	1	20.25	50	20.25	39.5	195%
CN369	203.7	0.0185	0.013	Circle	2.5				55.73	49.09	49.09	39.8	81%
CN369	305.9	0.0452	0.013	Circle	2.5				87.24	49.09	49.09	39.8	81%
CN369	160.6	0.0131	0.025	Circle	0				24.90	0	0.00	39.8	
CN369	105.8	0.0136	0.013	Circle	2.5				47.84	49.09	47.84	39.8	83%
CN369	31.2	0.0202	0.013	Circle	2.5				58.32	49.09	49.09	39.8	81%
CN369	151.0	0.0096	0.025	Circle	0				21.28	0	0.00	39.8	
CN369	22.5	0.0249	0.013	Circle	2.5				64.75	49.09	49.09	39.8	81%
CN369	186.8	0.0103	0.013	Circle	2.5				41.69	49.09	41.69	39.8	95%
CN370	79.6	0.0328	0.013	Circle	2.5				74.30	49.09	49.09	33.7	69%
CN370	255.6	0.0047	0.025	Trapezoid	0	1	1	2	22.89	60	22.89	33.7	147%
CN370	116.9	0.0034	0.025	Trapezoid	0	1	1	2	19.46	60	19.46	33.7	173%
CN370	21.5	-0.0186	0.013	Circle	0				0.00	0	0.00	33.7	
CN370	29.5	0.0352	0.025	Trapezoid	0	1	1	2	62.48	60	62.48	33.7	54%
CN370	129.2	-0.0015	0.024	Circle	3				0.00	70.69	0.00	33.7	
CN370	105.1	0.0028	0.025	Trapezoid	0	1	1	2	17.48	60	17.48	33.7	193%
CN372	40.7	0.0103	0.025	Trapezoid	0	0	1	5	220.70	250	220.70	23.7	11%
CN372	195.3	-0.0027	0.024	Circle	2				0.00	25.13	0.00	23.7	
CN372	228.7	0.0090	0.025	Trapezoid	0	0	1	5	206.67	250	206.67	23.7	11%
CN372	97.5	0.0322	0.013	Circle	4				257.73	125.66	125.66	23.7	19%
CN373	23.6	0.0165	0.013	Circle	2				29.06	25.13	25.13	6.2	25%
CN373	74.2	0.0067	0.024	Circle	2				10.06	25.13	10.06	6.2	62%
CN373	75.0	0.0167	0.024	Circle	2				15.82	25.13	15.82	6.2	39%
CN373	12.8	0.0172	0.024	Circle	2				16.08	25.13	16.08	6.2	39%
CN373	213.3	0.0009	0.024	Circle	2				3.75	25.13	3.75	6.2	165%
CN373	97.7	0.0007	0.024	Circle	2				3.28	25.13	3.28	6.2	189%
CN373	91.2	0.0001	0.024	Circle	2				1.28	25.13	1.28	6.2	483%
CN376	57.5	0.0111	0.013	Circle	2				23.86	25.13	23.86	2.8	12%
CN376	437.9	0.0028	0.013	Circle	2				12.04	25.13	12.04	2.8	23%
CN377	265.9	0.0029	0.013	Circle	1.5				5.69	14.14	5.69	3.4	60%
CN377	171.9	0.0035	0.013	Circle	1.5				6.26	14.14	6.26	3.4	54%
CN377	49.2	0.0104	0.013	Circle	1.5				10.69	14.14	10.69	3.4	32%
CN378	134.6	0.0055	0.013	Circle	2				16.78	25.13	16.78	20.5	122%
CN378	33.5	0.0788	0.013	Circle	2				63.50	25.13	25.13	20.5	82%
CN378	219.1	0.0076	0.013	Circle	2				19.69	25.13	19.69	20.5	104%
CN379	356.6	0.0038	0.013	Circle	2.25				18.99	31.81	18.99	29.4	155%
CN379	302.1	0.0072	0.013	Circle	2.25				26.19	31.81	26.19	29.4	112%
CN380	402.7	0.0233	0.013	Circle	2				34.51	25.13	25.13	15.3	61%
CN380	78.6	0.0050	0.013	Circle	2				15.94	25.13	15.94	15.3	96%
CN380	259.5	0.0043	0.013	Circle	2				14.86	25.13	14.86	15.3	103%
CN380	32.1	0.0081	0.013	Circle	2.25				27.87	31.81	27.87	15.3	55%
CN380	177.0	0.0050	0.013	Circle	2				15.95	25.13	15.95	15.3	96%
CN380	88.7	0.0215	0.013	Circle	2				33.20	25.13	25.13	15.3	61%
CN382	93.2	0.0042	0.013	Circle	2				14.64	25.13	14.64	44.2	302%
CN382	212.9	0.0003	0.013	Circle	2				3.80	25.13	3.80	44.2	1164%
CN382	308.3	0.0156	0.013	Circle	2				28.26	25.13	25.13	44.2	176%
CN383	77.5	0.0026	0.013	Circle	2				11.49	25.13	11.49	40.0	348%
CN383	165.9	0.0030	0.013	Circle	2				12.42	25.13	12.42	40.0	322%
CN383	148.7	0.0013	0.013	Circle	2				8.30	25.13	8.30	40.0	482%
CN383	365.6	0.0027	0.013	Circle	2				11.83	25.13	11.83	40.0	338%
CN383	47.3	0.0015	0.013	Circle	2				8.70	25.13	8.70	40.0	460%
CN384	80.7	0.0193	0.013	Circle	2				31.46	25.13	25.13	39.7	158%
CN384	224.9	0.0060	0.013	Circle	2				17.53	25.13	17.53	39.7	227%
CN384	289.8	0.0046	0.013	Circle	2				15.27	25.13	15.27	39.7	260%
CN386	395.0	0.0055	0.013	Circle	1.25				4.79	9.82	4.79	41.9	875%

HMI_ID	Length	Slope	n	Shape	Diameter	Dim_1	Dim_2	Dim_3	$Cap_{Manning}$	Cap_{vel}	Capacity	Peak	% of Capacity
	ft	ft/ft			ft	ft	ft	h:v	cfs	cfs	cfs	cfs	
CN386	196.6	0.0055	0.013	Circle	1.25				4.79	9.82	4.79	41.9	875%
CN386	26.4	0.0091	0.013	Circle	3				63.54	70.69	63.54	41.9	66%
CN386	43.0	0.0675	0.013	Circle	1.25				16.78	9.82	9.82	41.9	427%
CN386	31.1	0.0019	0.013	Circle	1.25				2.84	9.82	2.84	41.9	1476%
CN386	317.8	0.0309	0.013	Circle	1.25				11.36	9.82	9.82	41.9	427%
CN387	386.9	0.0041	0.013	Circle	3.33				56.63	87.09	56.63	290.3	513%
CN387	30.5	-0.0052	0.013	Circle	3.33				0.00	87.09	0.00	290.3	
CN387	1727.9	0.0075	0.025	Circle	0				0.00	0	0.00	290.3	
CN387	118.2	0.0080	0.025	Circle	0				0.00	0	0.00	290.3	
CN388	14.5	0.0062	0.024	Circle	2				9.65	25.13	9.65	22.4	232%
CN388	115.8	-0.0096	0.024	Circle	2				0.00	25.13	0.00	22.4	
CN388	216.3	-0.0007	0.013	Trapezoid	0	0	0.75	2	0.00	24	0.00	22.4	
CN388	70.2	0.0127	0.024	Circle	1.5				6.41	14.14	6.41	22.4	350%
CN388	94.2	0.0125	0.025	Trapezoid	0	0	0.75	2	14.20	24	14.20	22.4	158%
CN389	115.4	0.0026	0.013	Circle	2				11.54	25.13	11.54	28.1	244%
CN389	81.7	0.0075	0.013	Circle	2				19.55	25.13	19.55	28.1	144%
CN389	188.6	0.0054	0.013	Circle	2				16.56	25.13	16.56	28.1	170%
CN389	113.0	0.0049	0.013	Circle	0				0.00	0	0.00	28.1	
CN389	135.5	0.0014	0.013	Circle	2				8.47	25.13	8.47	28.1	332%
CN389	52.8	0.0127	0.013	Circle	2				25.48	25.13	25.13	28.1	112%
CN389	123.3	0.0058	0.013	Circle	2				17.16	25.13	17.16	28.1	164%
CN389	201.4	0.0050	0.013	Circle	2				16.02	25.13	16.02	28.1	175%
CN389	17.7	0.0051	0.013	Circle	2				16.13	25.13	16.13	28.1	174%
CN390	21.3	0.0376	0.013	Rectangle	0	3.5	1.5		75.74	52.5	52.50	14.8	28%
CN390	206.1	0.0069	0.013	Circle	2.5				34.04	49.09	34.04	14.8	43%
CN390	53.3	0.0374	0.013	Circle	0				75.49	0	0.00	14.8	
CN390	177.5	0.0081	0.013	Circle	2.5				36.82	49.09	36.82	14.8	40%
CN390	203.2	0.0071	0.013	Circle	2.5				34.65	49.09	34.65	14.8	43%
CN390	198.9	0.0005	0.013	Circle	2.5				8.72	49.09	8.72	14.8	170%
CN390	172.3	0.0023	0.013	Circle	2.5				19.51	49.09	19.51	14.8	76%
CN390	200.3	-0.0009	0.013	Circle	2.5				0.00	49.09	0.00	14.8	
CN391	34.7	0.0254	0.013	Circle	2				36.03	25.13	25.13	22.5	90%
CN391	10.8	-0.0092	0.013	Rectangle	0	3	1.6666667		0.00	50	0.00	22.5	
CN391	3.5	-0.2474	0.013	Rectangle	0	3	0.5		0.00	12	0.00	22.5	
CN391	93.4	-0.0004	0.024	Squash	0	2.5	1.5		0.00	23.56	0.00	22.5	
CN391	204.8	0.0004	0.024	Squash	0	2.5	1.5		2.28	23.56	2.28	22.5	986%
CN391	45.6	0.0732	0.013	Circle	1.5				28.42	14.14	14.14	22.5	159%
CN391	91.9	0.0062	0.024	Circle	2.5				17.50	49.09	17.50	22.5	129%
CN391	115.8	0.0077	0.013	Circle	2				19.83	25.13	19.83	22.5	113%
CN391	163.8	0.0093	0.024	Circle	2				11.84	25.13	11.84	22.5	190%
CN391	184.3	0.0005	0.024	Circle	2				2.85	25.13	2.85	22.5	788%
CN391	213.8	0.0005	0.013	Circle	2.25				7.02	31.81	7.02	22.5	320%
CN391	11.3	0.0380	0.013	Circle	2.25				60.40	31.81	31.81	22.5	71%
CN391	28.3	0.0198	0.013	Rectangle	0	3	1		25.09	24	24.00	22.5	94%
CN391	52.5	0.0152	0.013	Circle	1.25				7.97	9.82	7.97	22.5	282%
CN391	121.5	-0.0038	0.013	Rectangle	0	2.5	1.3333333		0.00	26.67	0.00	22.5	
CN391	52.2	0.0153	0.013	Circle	0				0.00	0	0.00	22.5	
CN396	184.4	0.0084	0.013	Circle	2				20.74	25.13	20.74	22.0	106%
CN396	118.3	0.0005	0.013	Circle	2				5.09	25.13	5.09	22.0	432%
CN396	113.6	-0.0058	0.013	Circle	2				0.00	25.13	0.00	22.0	
CN397	327.7	0.0047	0.013	Circle	3				45.58	70.69	45.58	59.0	129%
CN397	287.6	-0.0041	0.013	Circle	3				0.00	70.69	0.00	59.0	
CN4	114.2	0.0015	0.013	Circle	1.25				2.49	9.82	2.49	2.4	96%
CN4	98.8	0.0237	0.013	Circle	1.25				9.94	9.82	9.82	2.4	24%
CN4	56.7	0.0049	0.013	Circle	1.25				4.54	9.82	4.54	2.4	53%
CN4	97.0	-0.0066	0.013	Circle	1.25				0.00	9.82	0.00	2.4	
CN4	118.5	0.0175	0.013	Circle	1.25				8.54	9.82	8.54	2.4	28%
CN4	121.2	0.0176	0.013	Circle	1.25				8.56	9.82	8.56	2.4	28%
CN402	132.2	0.0089	0.013	Circle	4				135.72	125.66	125.66	141.1	112%
CN404	370.5	0.0045	0.013	Circle	4				96.44	125.66	96.44	80.2	83%
CN407	57.1	0.0058	0.013	Circle	0				0.00	0	0.00	33.1	
CN407	422.1	0.0058	0.013	Circle	0				0.00	0	0.00	33.1	
CN409	286.1	0.0039	0.013	Circle	3				41.55	70.69	41.55	55.9	135%
CN409	259.0	0.0030	0.013	Circle	3				36.37	70.69	36.37	55.9	154%
CN409	28.0	0.0029	0.013	Circle	3				35.62	70.69	35.62	55.9	157%
CN415	186.5	0.0058	0.013	Circle	1.5				7.99	14.14	7.99	0.5	6%
CN415	241.8	0.0270	0.013	Circle	1.5				17.28	14.14	14.14	0.5	4%
CN415	131.7	0.0068	0.013	Circle	1.5				8.68	14.14	8.68	0.5	6%
CN416	199.4	0.0041	0.013	Circle	2.5				26.30	49.09	26.30	9.9	38%
CN416	153.4	0.0030	0.013	Circle	2.5				22.46	49.09	22.46	9.9	44%
CN417	484.1	0.0032	0.013	Circle	2.5				23.36	49.09	23.36	21.0	90%
CN417	11.6	0.5977	0.013	Circle	1.25				49.94	9.82	9.82	21.0	214%
CN417	199.0	0.0063	0.013	Circle	2.33				27.15	34.11	27.15	21.0	77%
CN417	21.7	0.0032	0.013	Circle	2.5				23.28	49.09	23.28	21.0	90%
CN418	502.0	0.0065	0.013	Circle	2.5				32.95	49.09	32.95	33.0	100%
CN418	239.4	0.0709	0.013	Circle	2.5				109.25	49.09	49.09	33.0	67%

HMI_ID	Length	Slope	n	Shape	Diameter	Dim_1	Dim_2	Dim_3	$Cap_{Manning}$	Cap_{vel}	Capacity	Peak	% of Capacity
	ft	ft/ft			ft	ft	ft	h:v	cfs	cfs	cfs	cfs	
CN418	238.3	0.0637	0.013	Circle	1.5				26.51	14.14	14.14	33.0	233%
CN420	195.8	0.0034	0.024	Circle	2				7.12	25.13	7.12	29.2	410%
CN420	96.0	-0.0008	0.024	Circle	2				0.00	25.13	0.00	29.2	
CN420	48.7	0.0010	0.024	Circle	2				3.92	25.13	3.92	29.2	744%
CN420	166.5	-0.0080	0.024	Circle	2				0.00	25.13	0.00	29.2	
CN421	48.5	0.0115	0.024	Circle	2				13.16	25.13	13.16	7.3	55%
CN421	294.1	0.0797	0.024	Circle	2				34.59	25.13	25.13	7.3	29%
CN421	87.9	-0.0298	0.024	Circle	2				0.00	25.13	0.00	7.3	
CN421	37.4	0.1162	0.024	Circle	2				41.76	25.13	25.13	7.3	29%
CN421	114.7	0.0076	0.024	Circle	2				10.67	25.13	10.67	7.3	68%
CN421	213.9	0.0034	0.024	Circle	2				7.16	25.13	7.16	7.3	102%
CN421	102.4	0.0105	0.024	Circle	2				12.59	25.13	12.59	7.3	58%
CN421	44.7	0.0007	0.024	Circle	2				3.17	25.13	3.17	7.3	230%
CN422	276.6	0.0094	0.013	Circle	1.25				6.25	9.82	6.25	1.5	24%
CN422	169.6	0.0102	0.013	Circle	1.25				6.52	9.82	6.52	1.5	23%
CN422	155.7	0.0093	0.013	Circle	1.25				6.23	9.82	6.23	1.5	24%
CN423	301.2	0.0102	0.013	Circle	1.25				6.52	9.82	6.52	3.1	48%
CN423	148.0	0.0072	0.013	Circle	1.25				5.47	9.82	5.47	3.1	57%
CN423	52.3	0.0380	0.013	Circle	1.25				12.59	9.82	9.82	3.1	32%
CN423	55.3	0.0878	0.013	Circle	1.5				31.13	14.14	14.14	3.1	22%
CN423	252.4	0.0072	0.013	Circle	1.25				5.47	9.82	5.47	3.1	57%
CN425	192.0	0.0036	0.013	Circle	3				39.98	70.69	39.98	58.4	146%
CN425	135.4	-0.0102	0.013	Circle	2				0.00	25.13	0.00	58.4	
CN425	73.4	0.0147	0.013	Circle	3				80.89	70.69	70.69	58.4	83%
CN425	28.2	0.0146	0.013	Circle	3				80.46	70.69	70.69	58.4	83%
CN426	161.6	0.0210	0.013	Circle	3				96.61	70.69	70.69	59.3	84%
CN427	55.5	0.0043	0.013	Squash	0	3.1666667	2		55.00	49.74	49.74	52.0	105%
CN427	52.6	0.0179	0.013	Circle	3				89.12	70.69	70.69	52.0	74%
CN427	131.8	0.0039	0.013	Squash	2	3.1666667	2		25.31	49.74	25.31	52.0	205%
CN427	154.7	0.0058	0.013	Squash	0	3.1666667	2		55.00	49.74	49.74	52.0	105%
CN427	151.8	0.0140	0.013	Circle	2				55.00	25.13	25.13	52.0	207%
CN427	156.2	0.0119	0.013	Circle	2				55.00	25.13	25.13	52.0	207%
CN427	60.5	0.0709	0.013	Circle	2				60.25	25.13	25.13	52.0	207%
CN427	44.4	0.1495	0.013	Circle	0				157.31	0	0.00	52.0	
CN428	51.1	0.1359	0	Circle	1.25				0.00	9.82	0.00	0.0	
CN428	105.6	0.0206	0.013	Circle	2.5				58.93	49.09	49.09	44.2	90%
CN428	178.6	0.0108	0.013	Circle	2.5				42.63	49.09	42.63	44.2	104%
CN428	135.7	0.0088	0.013	Circle	3				62.46	70.69	62.46	44.2	71%
CN428	296.1	0.0055	0.013	Circle	3				49.49	70.69	49.49	44.2	89%
CN428	130.4	0.0012	0.013	Circle	3				22.62	70.69	22.62	44.2	195%
CN428	92.7	0.0097	0.013	Circle	2.5				40.41	49.09	40.41	44.2	109%
CN428	136.8	0.0040	0.013	Circle	3				42.29	70.69	42.29	44.2	105%
CN428	44.0	0.0039	0.013	Circle	2.5				25.49	49.09	25.49	44.2	173%
CN431	39.2	0.0049	0.013	Circle	3				46.45	70.69	46.45	65.1	140%
CN431	10.7	0.5388	0	Circle	1				0.00	6.28	0.00	0.0	
CN431	485.4	0.0047	0.013	Circle	3				45.91	70.69	45.91	65.1	142%
CN432	206.7	0.0030	0.013	Circle	3				36.53	70.69	36.53	54.6	149%
CN432	91.3	0.0030	0.013	Circle	3				36.27	70.69	36.27	54.6	151%
CN432	95.8	0.0029	0.013	Circle	3				36.05	70.69	36.05	54.6	151%
CN432	157.2	0.0029	0.013	Circle	3				36.08	70.69	36.08	54.6	151%
CN432	37.2	0.0030	0.013	Circle	3				36.25	70.69	36.25	54.6	151%
CN433	27.5	0.0073	0.013	Circle	3				56.92	70.69	56.92	41.7	73%
CN433	72.5	0.0073	0.013	Circle	3				57.03	70.69	57.03	41.7	73%
CN433	274.0	0.0026	0.013	Circle	3				33.71	70.69	33.71	41.7	124%
CN433	324.5	0.0030	0.013	Circle	3				36.28	70.69	36.28	41.7	115%
CN434	375.9	0.0049	0.013	Circle	2				15.91	25.13	15.91	32.3	203%
CN434	178.0	0.0048	0.013	Circle	1.5				7.30	14.14	7.30	32.3	442%
CN4430	34.5	0.0221	0.024	Circle	3				53.65	70.69	53.65	78.6	147%
CN4430	133.3	0.0440	0.024	Circle	3				75.83	70.69	70.69	78.6	111%
CN4430	235.2	0.0141	0.024	Circle	3				42.86	70.69	42.86	78.6	183%
CN4431	55.9	0.1070	0.013	Circle	2				74.00	25.13	25.13	74.4	296%
CN4431	83.3	-0.0010	0.013	Circle	3.67				0.00	105.78	0.00	74.4	
CN4431	688.9	0.0012	0.025	Trapezoid	0	0	0	0	0.00	0	0.00	74.4	
CN4431	440.8	0.0023	0.013	Circle	3.67				55.06	105.78	55.06	74.4	135%
CN4431	344.1	-0.0004	0.013	Circle	3.67				0.00	105.78	0.00	74.4	
CN4431	28.2	-0.1805	0.013	Circle	2				0.00	25.13	0.00	74.4	
CN4431	328.8	0.0017	0.013	Circle	3.67				47.01	105.78	47.01	74.4	158%
CN4431	640.6	0.0016	0.013	Circle	3.67				45.00	105.78	45.00	74.4	165%
CN4431	236.1	0.0015	0.013	Circle	3.67				43.85	105.78	43.85	74.4	170%
CN4431	143.1	0.0062	0.013	Circle	3.67				89.33	105.78	89.33	74.4	83%
CN4432	38.5	0.0985	0.013	Circle	4				450.77	125.66	125.66	70.7	56%
CN4432	259.6	0.0101	0.013	Circle	4				144.58	125.66	125.66	70.7	56%
CN4432	399.1	0.0097	0.013	Circle	4				141.82	125.66	125.66	70.7	56%
CN4433	528.0	0.0224	0.013	Circle	1.5				15.74	14.14	14.14	7.6	54%
CN4434	27.8	0.3419	0.024	Circle	2				71.65	25.13	25.13	8.1	32%
CN4434	158.4	0.0081	0.024	Circle	1.5				5.13	14.14	5.13	8.1	158%

HMI_ID	Length	Slope	n	Shape	Diameter	Dim_1	Dim_2	Dim_3	$Cap_{Manning}$	Cap_{vel}	Capacity	Peak	% of Capacity
	ft	ft/ft			ft	ft	ft	h:v	cfs	cfs	cfs	cfs	
CN4434	25.6	0.0168	0.013	Circle	1.5				13.60	14.14	13.60	8.1	60%
CN4434	44.3	-0.0045	0.013	Circle	1.5				0.00	14.14	0.00	8.1	
CN4434	21.3	-0.1205	0.013	Circle	2				0.00	25.13	0.00	8.1	
CN4434	50.9	0.0381	0.013	Circle	1.5				20.51	14.14	14.14	8.1	57%
CN4435	70.8	0.0423	0.024	Circle	1.25				7.19	9.82	7.19	3.3	46%
CN4435	68.6	0.0112	0.024	Circle	1.25				3.71	9.82	3.71	3.3	89%
CN4435	24.8	0.0202	0.024	Circle	1.25				4.97	9.82	4.97	3.3	66%
CN4435	113.4	-0.0074	0.024	Circle	1.25				0.00	9.82	0.00	3.3	
CN4435	10.8	0.0287	0.013	Rectangle	0	0	0		0.00	0	0.00	3.3	
CN4435	9.5	0.3120	0.013	Circle	1.25				36.08	9.82	9.82	3.3	34%
CN4435	38.0	0.0055	0.024	Circle	1.25				2.60	9.82	2.60	3.3	127%
CN4435	53.2	0.0034	0.024	Circle	1.25				2.04	9.82	2.04	3.3	162%
CN4435	56.0	0.0021	0.024	Circle	1.25				1.62	9.82	1.62	3.3	204%
CN4436	382.4	0.0001	0.024	Circle	2				1.09	25.13	1.09	13.8	1271%
CN4436	71.3	0.0128	0.013	Circle	1.75				17.90	19.24	17.90	13.8	77%
CN4436	175.4	0.0169	0.013	Circle	1.75				20.58	19.24	19.24	13.8	72%
CN4436	49.7	0.0084	0.013	Circle	2				20.79	25.13	20.79	13.8	66%
CN4436	35.3	0.0057	0.013	Circle	1.75				11.93	19.24	11.93	13.8	116%
CN4437	252.8	-0.1665	0.024	Circle	2				0.00	25.13	0.00	75.5	
CN4438	130.6	0.2225	0.024	Circle	2				57.80	25.13	25.13	81.7	325%
CN4438	30.3	0.2199	0.025	Trapezoid	0	0	0.5	3	96.12	36	96.12	81.7	85%
CN4438	66.2	0.2159	0.013	Circle	2				105.13	25.13	25.13	81.7	325%
CN4438	26.8	-0.0280	0.013	Circle	2				0.00	25.13	0.00	81.7	
CN4438	180.2	0.0154	0.013	Circle	2				28.05	25.13	25.13	81.7	325%
CN4439	44.0	0.0104	0.024	Circle	1.25				3.58	9.82	3.58	2.9	81%
CN4439	74.1	0.0012	0.013	Squash	0	2.5	1		3.82	15.71	3.82	2.9	76%
CN4439	99.6	0.0111	0.024	Circle	1.5				6.01	14.14	6.01	2.9	48%
CN4439	182.5	0.0019	0.024	Circle	1.5				2.46	14.14	2.46	2.9	118%
CN4440	438.5	0.0083	0.013	Circle	2.5				37.47	49.09	37.47	8.6	23%
CN4440	269.6	0.0111	0.013	Circle	2.5				43.19	49.09	43.19	8.6	20%
CN4440	207.9	0.0051	0.013	Circle	2.5				29.29	49.09	29.29	8.6	29%
CN4440	224.5	0.0052	0.013	Circle	2.5				29.61	49.09	29.61	8.6	29%
CN4440	195.4	0.0047	0.013	Circle	2				15.52	25.13	15.52	8.6	55%
CN4440	17.3	0.0168	0.013	Circle	2				29.33	25.13	25.13	8.6	34%
CN4441	137.2	0.0087	0.013	Circle	2.5				38.36	49.09	38.36	0.0	0%
CN4441	59.8	0.0089	0.013	Circle	2.5				38.61	49.09	38.61	0.0	0%
CN4442	107.3	0.0022	0.013	Circle	2.5				19.40	49.09	19.40	4.3	22%
CN4442	85.8	0.0042	0.013	Circle	2.5				26.57	49.09	26.57	4.3	16%
CN4442	111.4	0.0023	0.013	Circle	2.5				19.82	49.09	19.82	4.3	22%
CN4442	53.7	0.0043	0.013	Circle	2.5				26.84	49.09	26.84	4.3	16%
CN4442	70.7	-0.0024	0.013	Circle	2.5				0.00	49.09	0.00	4.3	
CN4442	25.5	-0.0024	0.013	Circle	2.5				0.00	49.09	0.00	4.3	
CN4443	144.5	0.0023	0.013	Circle	2.5				19.60	49.09	19.60	10.8	55%
CN4443	46.5	-0.0297	0.013	Circle	2.5				0.00	49.09	0.00	10.8	
CN4443	396.6	0.0023	0.013	Circle	2.5				19.54	49.09	19.54	10.8	55%
CN4443	88.3	0.0139	0.013	Circle	2.5				48.41	49.09	48.41	10.8	22%
CN4444	304.4	0.0036	0.013	Circle	2.5				24.77	49.09	24.77	20.2	82%
CN4444	124.4	0.0064	0.013	Circle	2.5				32.89	49.09	32.89	20.2	61%
CN4444	45.7	0.1765	0.013	Circle	1.5				44.13	14.14	14.14	20.2	143%
CN4444	45.4	0.1774	0.013	Circle	1.5				44.25	14.14	14.14	20.2	143%
CN4444	367.7	0.0061	0.013	Circle	2.5				32.08	49.09	32.08	20.2	63%
CN4444	130.3	0.0027	0.013	Circle	2.5				21.26	49.09	21.26	20.2	95%
CN4444	308.4	0.0032	0.013	Circle	2.5				23.24	49.09	23.24	20.2	87%
CN4445	252.2	0.0018	0.013	Circle	2.5				17.33	49.09	17.33	8.5	49%
CN4445	15.6	0.0103	0.013	Circle	2.5				41.56	49.09	41.56	8.5	20%
CN4445	243.7	0.0042	0.013	Circle	2.5				26.67	49.09	26.67	8.5	32%
CN4445	103.2	0.0024	0.013	Circle	2.5				20.18	49.09	20.18	8.5	42%
CN4445	22.8	0.0083	0.013	Circle	1.5				9.59	14.14	9.59	8.5	89%
CN4445	23.1	0.0082	0.013	Circle	1.5				9.52	14.14	9.52	8.5	89%
CN4446	253.9	0.0087	0.013	Circle	2.5				38.36	49.09	38.36	8.5	22%
CN4446	103.8	0.0256	0.013	Circle	2.5				65.65	49.09	49.09	8.5	17%
CN4446	299.8	0.0067	0.013	Circle	2.5				33.50	49.09	33.50	8.5	25%
CN4446	89.6	0.0037	0.013	Circle	2.5				24.90	49.09	24.90	8.5	34%
CN4446	142.9	0.0359	0.013	Circle	2.5				77.71	49.09	49.09	8.5	17%
CN4447	108.0	0.0096	0.013	Circle	2.5				40.25	49.09	40.25	27.8	69%
CN4448	153.6	0.0100	0.013	Circle	2.5				41.07	49.09	41.07	34.0	83%
CN4448	262.6	-0.0031	0.013	Circle	2.5				0.00	49.09	0.00	34.0	
CN4449	62.0	0.0094	0.013	Circle	0.67				1.17	2.82	1.17	3.3	282%
CN4449	122.0	0.0045	0.016	Circle	0.67				0.66	2.82	0.66	3.3	501%
CN4449	113.0	0.0095	0.016	Circle	0.67				0.96	2.82	0.96	3.3	345%
CN4450	152.5	0.0064	0.013	Circle	1.25				5.15	9.82	5.15	3.6	70%
CN4450	61.7	0.0066	0.024	Circle	1.5				4.64	14.14	4.64	3.6	78%
CN4450	63.8	0.0064	0.013	Circle	1.25				5.18	9.82	5.18	3.6	70%
CN4450	152.7	0.0056	0.013	Circle	1.25				4.82	9.82	4.82	3.6	75%
CN4450	274.7	0.0061	0.013	Circle	1.25				5.05	9.82	5.05	3.6	71%
CN4450	270.6	0.0036	0.013	Circle	1.25				3.87	9.82	3.87	3.6	93%

HMI_ID	Length	Slope	n	Shape	Diameter	Dim_1	Dim_2	Dim_3	$Cap_{Manning}$	Cap_{vel}	Capacity	Peak	% of Capacity
	ft	ft/ft			ft	ft	ft	h:v	cfs	cfs	cfs	cfs	
CN4451	174.3	0.0074	0.013	Circle	2				19.46	25.13	19.46	10.9	56%
CN4451	96.1	0.0548	0.013	Circle	2				52.94	25.13	25.13	10.9	43%
CN4451	89.8	0.0132	0.013	Circle	2				26.04	25.13	25.13	10.9	43%
CN4451	107.1	0.0667	0.013	Circle	2				58.44	25.13	25.13	10.9	43%
CN4451	114.2	0.0371	0.013	Circle	2				43.58	25.13	25.13	10.9	43%
CN4451	34.6	0.0544	0.013	Circle	2				52.75	25.13	25.13	10.9	43%
CN4452	220.6	0.0064	0.024	Circle	1.5				4.56	14.14	4.56	5.3	116%
CN4452	73.6	0.0211	0.024	Circle	1.5				8.26	14.14	8.26	5.3	64%
CN4452	151.2	0.0047	0.024	Circle	1.5				3.90	14.14	3.90	5.3	136%
CN4452	228.3	0.0052	0.024	Circle	1.5				4.09	14.14	4.09	5.3	130%
CN4452	58.5	0.0060	0.024	Circle	1.5				4.40	14.14	4.40	5.3	120%
CN4452	375.3	0.0046	0.024	Circle	1.5				3.87	14.14	3.87	5.3	137%
CN4453	65.6	0.0093	0.013	Circle	2.5				39.54	49.09	39.54	12.2	31%
CN4453	330.8	0.0057	0.013	Circle	2.5				30.84	49.09	30.84	12.2	40%
CN4454	204.0	-0.0012	0.024	Circle	1.25				0.00	9.82	0.00	2.0	
CN4454	24.3	-0.0132	0.024	Circle	1.25				0.00	9.82	0.00	2.0	
CN4454	44.1	-0.0207	0.024	Circle	1.25				0.00	9.82	0.00	2.0	
CN4454	189.0	0.0360	0.024	Circle	1.25				6.64	9.82	6.64	2.0	30%
CN4455	107.5	0.0180	0.013	Circle	1				4.79	6.28	4.79	2.4	50%
CN4455	140.7	0.0222	0.024	Circle	1.25				5.21	9.82	5.21	2.4	46%
CN4455	290.4	0.0044	0.013	Circle	1				2.37	6.28	2.37	2.4	101%
CN4455	24.1	0.1668	0.024	Circle	1.25				14.29	9.82	9.82	2.4	24%
CN4455	100.9	-0.0087	0.013	Circle	1.25				0.00	9.82	0.00	2.4	
CN4455	134.3	0.0196	0.024	Circle	1.25				4.90	9.82	4.90	2.4	49%
CN4455	119.9	0.0498	0.024	Circle	1.25				7.81	9.82	7.81	2.4	31%
CN4456	14.0	0.0078	0.024	Circle	1.5				5.04	14.14	5.04	5.4	107%
CN4456	43.3	0.0072	0.024	Circle	1.5				4.81	14.14	4.81	5.4	112%
CN4456	42.4	0.0073	0.024	Circle	1.5				4.87	14.14	4.87	5.4	111%
CN4456	21.5	0.0075	0.024	Circle	1.5				4.91	14.14	4.91	5.4	110%
CN4456	111.6	0.0072	0.024	Circle	1.5				4.82	14.14	4.82	5.4	112%
CN4456	68.9	0.0073	0.024	Circle	1.5				4.85	14.14	4.85	5.4	111%
CN4456	35.9	0.0070	0.024	Circle	1.5				4.75	14.14	4.75	5.4	114%
CN4456	147.5	0.0014	0.024	Circle	1.5				2.15	14.14	2.15	5.4	251%
CN4456	26.0	0.0069	0.024	Circle	1.5				4.74	14.14	4.74	5.4	114%
CN4456	175.6	0.0066	0.024	Circle	2				9.96	25.13	9.96	5.4	54%
CN4456	45.9	0.0514	0.024	Circle	1.5				12.90	14.14	12.90	5.4	42%
CN4456	34.9	-0.0114	0.024	Circle	1.5				0.00	14.14	0.00	5.4	
CN4456	14.7	0.2648	0.024	Circle	1.5				29.28	14.14	14.14	5.4	38%
CN4457	89.3	0.0496	0.024	Circle	2				27.29	25.13	25.13	8.4	33%
CN4457	368.4	0.0028	0.024	Circle	1.5				3.02	14.14	3.02	8.4	278%
CN4457	36.4	0.0121	0.024	Circle	2				13.47	25.13	13.47	8.4	62%
CN4457	118.3	0.0088	0.024	Circle	4				72.94	125.66	72.94	8.4	12%
CN4457	145.0	0.0072	0.024	Circle	4				65.89	125.66	65.89	8.4	13%
CN4457	14.7	0.0088	0.024	Circle	2				11.53	25.13	11.53	8.4	73%
CN4458	154.7	0.0090	0.024	Circle	1.5				5.39	14.14	5.39	162.0	3004%
CN4458	145.0	0.0044	0.024	Circle	1.5				3.78	14.14	3.78	162.0	4286%
CN4458	74.0	0.0123	0.024	Circle	1.5				6.31	14.14	6.31	162.0	2568%
CN4458	66.8	-0.0052	0.024	Circle	1.5				0.00	14.14	0.00	162.0	
CN4458	67.8	-0.0052	0.024	Circle	1.5				0.00	14.14	0.00	162.0	
CN4458	36.9	-0.0019	0.024	Circle	1.5				0.00	14.14	0.00	162.0	
CN4458	44.9	0.0080	0.024	Circle	1.5				5.10	14.14	5.10	162.0	3178%
CN4458	21.3	-0.0019	0.024	Circle	2.5				0.00	49.09	0.00	162.0	
CN4458	37.8	-0.0019	0.024	Circle	1.5				0.00	14.14	0.00	162.0	
CN4458	45.4	0.0079	0.024	Circle	1.5				5.06	14.14	5.06	162.0	3199%
CN4459	127.1	0.0172	0.013	Circle	1				4.68	6.28	4.68	3.4	73%
CN4459	269.1	0.0111	0.013	Circle	1.25				6.81	9.82	6.81	3.4	50%
CN4459	166.9	0.0171	0.013	Circle	1				4.66	6.28	4.66	3.4	73%
CN4460	365.1	0.0058	0.013	Circle	1.5				8.02	14.14	8.02	1.3	16%
CN4460	226.4	0.0024	0.013	Circle	1.25				3.18	9.82	3.18	1.3	41%
CN4461	356.6	0.0036	0.024	Circle	1.25				2.09	9.82	2.09	3.2	153%
CN4461	357.6	0.0097	0.024	Circle	1.25				3.45	9.82	3.45	3.2	93%
CN4461	164.3	0.0758	0.013	Circle	1.25				17.79	9.82	9.82	3.2	33%
CN4462	158.9	0.0196	0.013	Circle	1.25				9.05	9.82	9.05	2.1	23%
CN4463	53.6	0.0187	0.024	Circle	1.25				4.78	9.82	4.78	5.3	111%
CN4465	61.4	-0.0083	0.013	Trapezoid	0	0	0	0	0.00	0	0.00	5.3	
CN4465	91.6	0.0083	0.024	Circle	1.5				5.18	14.14	5.18	5.3	102%
CN4465	5.1	-0.2824	0.024	Circle	1.5				0.00	14.14	0.00	5.3	
CN4465	103.4	-0.0054	0.024	Circle	2				0.00	25.13	0.00	5.3	
CN4465	12.0	-0.0075	0.013	Circle	1.5				0.00	14.14	0.00	5.3	
CN4465	112.0	0.0104	0.013	Trapezoid	0	0	0	0	0.00	0	0.00	5.3	
CN4465	40.4	0.1235	0.024	Circle	1				6.78	6.28	6.28	5.3	84%
CN4465	96.0	0.0566	0.024	Circle	1.5				13.53	14.14	13.53	5.3	39%
CN4465	138.5	-0.0056	0.024	Circle	1.5				0.00	14.14	0.00	5.3	
CN4465	82.5	-0.0056	0.024	Circle	1.5				0.00	14.14	0.00	5.3	
CN4466	80.7	0.0021	0.013	Circle	0.67				0.55	2.82	0.55	3.7	667%
CN4466	377.2	0.0073	0.013	Circle	0.67				1.03	2.82	1.03	3.7	359%

HMI_ID	Length	Slope	n	Shape	Diameter	Dim_1	Dim_2	Dim_3	$Cap_{Manning}$	Cap_{vel}	Capacity	Peak	% of Capacity
	ft	ft/ft			ft	ft	ft	h:v	cfs	cfs	cfs	cfs	
CN4467	162.5	0.0209	0.013	Circle	1.25				9.33	9.82	9.33	8.3	89%
CN4468	108.2	0.0630	0.013	Circle	2				56.80	25.13	25.13	15.1	60%
CN4468	321.5	0.0630	0.013	Circle	2				56.79	25.13	25.13	15.1	60%
CN4468	150.6	0.0630	0.013	Circle	2				56.78	25.13	25.13	15.1	60%
CN4469	49.2	0.0053	0.024	Circle	1				1.40	6.28	1.40	10.1	720%
CN4469	249.8	0.0189	0.013	Circle	0				0.00	0	0.00	10.1	
CN4469	29.7	0.0290	0.024	Circle	1.25				5.96	9.82	5.96	10.1	170%
CN4469	483.2	0.0053	0.013	Circle	1				2.60	6.28	2.60	10.1	389%
CN4469	21.3	0.0052	0.013	Circle	1				2.56	6.28	2.56	10.1	395%
CN4469	92.2	-0.0016	0.013	Circle	1.25				0.00	9.82	0.00	10.1	
CN447	54.6	0.0027	0.024	Circle	4.33				50.47	147.25	50.47	76.2	151%
CN447	57.1	0.0012	0.024	Circle	4.33				33.72	147.25	33.72	76.2	226%
CN447	133.3	0.0018	0.024	Circle	4.33				40.87	147.25	40.87	76.2	186%
CN447	42.1	0.0017	0.024	Circle	4.33				39.26	147.25	39.26	76.2	194%
CN447	6.7	0.0134	0.024	Circle	4.33				111.35	147.25	111.35	76.2	68%
CN447	256.7	0.0044	0.024	Circle	5				94.02	196.35	94.02	76.2	81%
CN447	191.1	0.0033	0.024	Circle	4.33				55.75	147.25	55.75	76.2	137%
CN447	102.3	0.0045	0.024	Circle	4.33				64.59	147.25	64.59	76.2	118%
CN447	19.9	0.0035	0.024	Circle	4.33				57.13	147.25	57.13	76.2	133%
CN447	9.2	-0.0044	0.024	Circle	4.33				0.00	147.25	0.00	76.2	
CN447	28.9	0.0028	0.024	Circle	4.33				50.68	147.25	50.68	76.2	150%
CN447	33.2	0.0030	0.024	Circle	4.33				52.86	147.25	52.86	76.2	144%
CN447	128.7	0.0029	0.024	Circle	4.33				51.64	147.25	51.64	76.2	148%
CN447	67.8	0.0028	0.024	Circle	4.33				50.99	147.25	50.99	76.2	149%
CN447	135.8	0.0029	0.024	Circle	4.33				51.61	147.25	51.61	76.2	148%
CN4470	143.9	0.0154	0.013	Circle	0				0.00	0	0.00	25.7	
CN4470	77.1	0.0189	0.013	Circle	0				0.00	0	0.00	25.7	
CN4471	130.6	0.0439	0.013	Circle	1.25				13.53	9.82	9.82	5.8	59%
CN4471	23.4	0.0260	0.024	Squash	0	1.6666667	1		5.96	10.47	5.96	5.8	97%
CN4471	17.2	0.2627	0.013	Circle	1.25				33.11	9.82	9.82	5.8	59%
CN4472	306.9	0.0189	0.013	Circle	1.5				14.45	14.14	14.14	26.8	190%
CN4472	157.2	0.0239	0.013	Circle	1.5				16.22	14.14	14.14	26.8	190%
CN4472	328.9	0.0168	0.013	Circle	1.5				13.61	14.14	13.61	26.8	197%
CN4472	301.6	0.0146	0.013	Circle	1.5				12.67	14.14	12.67	26.8	211%
CN4472	193.7	0.0246	0.013	Circle	1.5				16.47	14.14	14.14	26.8	190%
CN4472	387.7	0.0076	0.013	Circle	1.5				9.18	14.14	9.18	26.8	292%
CN4473	121.0	0.0239	0.013	Circle	2				34.96	25.13	25.13	40.3	160%
CN4473	26.1	0.2207	0.013	Circle	1.5				49.35	14.14	14.14	40.3	285%
CN4474	131.4	0.0081	0.013	Circle	1.5				9.44	14.14	9.44	14.2	151%
CN4474	148.2	0.0013	0.013	Circle	1.5				3.86	14.14	3.86	14.2	368%
CN4474	279.3	0.0045	0.013	Circle	1.25				4.34	9.82	4.34	14.2	327%
CN4474	155.7	0.0134	0.013	Circle	1.25				7.47	9.82	7.47	14.2	190%
CN4475	59.5	0.0338	0.013	Circle	2				41.58	25.13	25.13	28.6	114%
CN4475	146.9	0.0081	0.013	Circle	2				20.36	25.13	20.36	28.6	140%
CN4476	179.0	0.0097	0.024	Circle	1				1.90	6.28	1.90	2.5	132%
CN4477	53.3	0.0801	0.013	Circle	1.25				18.28	9.82	9.82	26.0	265%
CN4477	87.0	0.0241	0.013	Circle	1.25				10.03	9.82	9.82	26.0	265%
CN4477	51.6	0.0488	0.013	Circle	1				7.87	6.28	6.28	26.0	414%
CN4477	40.6	0.0042	0.013	Circle	1.5				6.80	14.14	6.80	26.0	383%
CN4477	23.1	0.0212	0.013	Circle	1.5				15.30	14.14	14.14	26.0	184%
CN4477	252.3	0.0970	0.013	Circle	1				11.10	6.28	6.28	26.0	414%
CN4477	211.5	0.0186	0.013	Circle	1.5				14.32	14.14	14.14	26.0	184%
CN4478	352.3	0.0111	0.013	Circle	1.25				6.81	9.82	6.81	4.1	60%
CN4478	159.4	0.0479	0.013	Circle	1.25				14.13	9.82	9.82	4.1	42%
CN4479	560.6	0.0108	0.013	Circle	1.25				6.70	9.82	6.70	7.8	116%
CN4479	166.5	0.0076	0.013	Circle	1.25				5.62	9.82	5.62	7.8	139%
CN4479	28.8	0.0191	0.013	Circle	1.25				8.92	9.82	8.92	7.8	87%
CN4479	22.5	0.1060	0.013	Circle	2				73.65	25.13	25.13	7.8	31%
CN448	294.8	0.0142	0.013	Circle	1.25				7.69	9.82	7.69	7.0	91%
CN448	132.7	0.0180	0.013	Circle	1.25				8.67	9.82	8.67	7.0	81%
CN448	141.5	0.0238	0.013	Circle	2				34.87	25.13	25.13	7.0	28%
CN4480	182.8	0.0060	0.013	Circle	1.67				10.74	17.52	10.74	2.4	22%
CN4480	180.2	0.0095	0.013	Circle	1.25				6.29	9.82	6.29	2.4	38%
CN4480	161.6	0.0015	0.013	Circle	1.5				4.13	14.14	4.13	2.4	58%
CN4480	185.8	0.0039	0.013	Circle	1.5				6.54	14.14	6.54	2.4	37%
CN4480	27.1	0.0177	0.013	Circle	1.5				13.98	14.14	13.98	2.4	17%
CN4480	262.0	0.0094	0.013	Circle	1.5				10.18	14.14	10.18	2.4	24%
CN4480	392.1	0.0060	0.013	Circle	1.5				8.13	14.14	8.13	2.4	30%
CN4480	162.9	0.0000	0.013	Circle	1.25				0.00	9.82	0.00	2.4	
CN4480	31.8	0.0258	0.013	Circle	1.5				16.87	14.14	14.14	2.4	17%
CN4480	16.0	0.0094	0.013	Circle	1.67				13.48	17.52	13.48	2.4	18%
CN4481	97.6	0.0106	0.024	Circle	1.5				5.85	14.14	5.85	0.0	0%
CN4481	119.2	0.0258	0.024	Circle	2				19.70	25.13	19.70	0.0	0%
CN4481	808.1	0.0095	0.024	Circle	2				11.93	25.13	11.93	0.0	0%
CN4481	32.2	0.0379	0.024	Squash	0	2	1.5		16.08	18.85	16.08	0.0	0%
CN4481	115.2	0.0112	0.013	Circle	1.25				6.84	9.82	6.84	0.0	0%

HMI_ID	Length	Slope	n	Shape	Diameter	Dim_1	Dim_2	Dim_3	$Cap_{Manning}$	Cap_{vel}	Capacity	Peak	% of Capacity
	ft	ft/ft			ft	ft	ft	h:v	cfs	cfs	cfs	cfs	
CN4482	352.4	0.0147	0.024	Circle	1.5				6.90	14.14	6.90	16.7	242%
CN4483	35.3	0.0003	0.024	Circle	1				0.32	6.28	0.32	9.5	2925%
CN4484	179.3	0.0093	0.013	Circle	1.25				6.24	9.82	6.24	12.1	194%
CN4484	4.7	0.0192	0.013	Circle	0				0.00	0	0.00	12.1	
CN4485	176.3	0.0080	0.013	Circle	0.83				1.96	4.33	1.96	2.2	112%
CN4485	165.8	0.0166	0.013	Circle	0.83				2.82	4.33	2.82	2.2	78%
CN4485	44.9	-0.0102	0.013	Circle	3				0.00	70.69	0.00	2.2	
CN4486	90.0	-0.0103	0.013	Rectangle	0	4	2.1666667		0.00	86.67	0.00	2.2	
CN4486	69.1	0.0033	0.013	Rectangle	0	4	2.1666667		45.17	86.67	45.17	2.2	5%
CN4486	15.3	0.1228	0.013	Rectangle	0	4	2.1666667		274.42	86.67	86.67	2.2	3%
CN4486	310.0	0.0038	0.013	Circle	2				13.90	25.13	13.90	2.2	16%
CN4487	11.8	0.0118	0.013	Rectangle	0	5.25	1		36.63	52.5	36.63	2.2	6%
CN4487	17.4	-0.0040	0.024	Circle	1.5				0.00	14.14	0.00	2.2	
CN4487	99.8	0.0056	0.024	Circle	1.5				4.26	14.14	4.26	2.2	52%
CN4487	115.7	0.0029	0.013	Circle	1.5				5.69	14.14	5.69	2.2	39%
CN4487	162.3	0.0190	0.013	Circle	1.5				14.49	14.14	14.14	2.2	16%
CN4487	119.1	-0.0020	0.013	Circle	2.25				0.00	31.81	0.00	2.2	
CN4487	90.8	0.0113	0.013	Rectangle	0	5.25	1		35.85	52.5	35.85	2.2	6%
CN4487	113.4	0.0115	0.024	Circle	2				13.12	25.13	13.12	2.2	17%
CN4487	98.7	0.0057	0.024	Circle	1.5				4.29	14.14	4.29	2.2	51%
CN4487	252.6	0.0048	0.024	Circle	2				8.48	25.13	8.48	2.2	26%
CN4487	60.5	0.0124	0.013	Squash	0	1.1666667	1.8333333		10.66	13.44	10.66	2.2	21%
CN4487	60.3	0.0124	0.013	Squash	0	1.1666667	1.8333333		10.68	13.44	10.68	2.2	21%
CN4487	18.7	0.0096	0.024	Circle	3				35.43	70.69	35.43	2.2	6%
CN4487	375.8	-0.0016	0.024	Circle	2				0.00	25.13	0.00	2.2	
CN4487	316.5	-0.0001	0.024	Circle	2				0.00	25.13	0.00	2.2	
CN4487	17.2	-0.0041	0.024	Circle	1.5				0.00	14.14	0.00	2.2	
CN4487	32.2	-0.0084	0.013	Circle	2.5				0.00	49.09	0.00	2.2	
CN4487	29.7	0.0030	0.024	Circle	3				19.87	70.69	19.87	2.2	11%
CN4487	609.9	0.0030	0.013	Rectangle	0	2.5	1.25		10.83	25	10.83	2.2	20%
CN4487	29.7	-0.0047	0.013	Circle	2.25				0.00	31.81	0.00	2.2	
CN4487	394.6	0.0009	0.013	Circle	2.25				9.48	31.81	9.48	2.2	23%
CN4488	136.6	-0.0085	0.013	Circle	2.5				0.00	49.09	0.00	7.8	
CN4488	253.1	0.0060	0.013	Circle	2.5				31.68	49.09	31.68	7.8	25%
CN4488	22.2	0.5179	0.013	Circle	2				162.80	25.13	25.13	7.8	31%
CN4488	106.6	0.0032	0.013	Circle	2.5				23.16	49.09	23.16	7.8	34%
CN4489	9.8	0.1710	0.024	Squash	0	2.5	1.5		45.04	23.56	23.56	15.6	66%
CN4489	74.7	0.0040	0.024	Circle	2.5				14.08	49.09	14.08	15.6	111%
CN4489	8.3	0.3564	0.024	Circle	1.25				20.89	9.82	9.82	15.6	159%
CN4489	64.9	0.0065	0.013	Circle	1.25				5.20	9.82	5.20	15.6	300%
CN4489	343.4	0.0012	0.013	Circle	1.25				2.26	9.82	2.26	15.6	691%
CN4489	11.7	0.0154	0.024	Circle	2.5				27.53	49.09	27.53	15.6	57%
CN449	112.6	0.0067	0.013	Circle	1.5				8.57	14.14	8.57	12.3	143%
CN449	84.5	0.0049	0.013	Circle	1.5				7.32	14.14	7.32	12.3	168%
CN449	87.7	0.0033	0.013	Circle	1.5				6.04	14.14	6.04	12.3	204%
CN4490	178.1	0.0103	0.013	Circle	2.5				41.58	49.09	41.58	29.9	72%
CN4490	58.6	0.0379	0.013	Circle	2				44.04	25.13	25.13	29.9	119%
CN4490	58.4	0.0380	0.013	Circle	2				44.10	25.13	25.13	29.9	119%
CN4491	121.2	0.0055	0.013	Circle	1.5				7.81	14.14	7.81	2.0	26%
CN4491	15.5	0.2271	0.013	Circle	2				107.80	25.13	25.13	2.0	8%
CN451	388.5	0.0066	0.013	Circle	1.67				11.27	17.52	11.27	5.1	45%
CN451	218.0	0.0064	0.013	Circle	1.67				11.15	17.52	11.15	5.1	46%
CN451	44.4	0.0319	0.013	Circle	0.83				3.92	4.33	3.92	5.1	130%
CN451	293.1	0.0029	0.013	Circle	1.67				7.45	17.52	7.45	5.1	68%
CN451	303.9	0.0034	0.013	Circle	1.67				8.06	17.52	8.06	5.1	63%
CN451	90.1	0.0081	0.024	Circle	1.67				6.78	17.52	6.78	5.1	75%
CN452	105.2	0.0032	0.013	Circle	1.25				3.67	9.82	3.67	3.7	101%
CN452	136.4	0.0104	0.024	Circle	1.25				3.57	9.82	3.57	3.7	104%
CN452	93.3	0.0464	0.013	Circle	1.67				29.97	17.52	17.52	3.7	21%
CN452	335.1	0.0032	0.013	Circle	1.67				7.82	17.52	7.82	3.7	47%
CN453	36.4	0.0000	0.024	Circle	2				0.00	25.13	0.00	8.8	
CN453	121.2	0.0092	0.024	Circle	2				11.78	25.13	11.78	8.8	75%
CN453	239.8	0.0075	0.024	Circle	2				10.59	25.13	10.59	8.8	83%
CN454	155.3	0.0189	0.024	Circle	2				16.86	25.13	16.86	16.8	100%
CN454	64.6	0.0189	0.024	Circle	2				16.84	25.13	16.84	16.8	100%
CN454	30.7	0.0000	0.024	Circle	2				0.00	25.13	0.00	16.8	
CN454	224.2	0.0074	0.024	Circle	2				10.54	25.13	10.54	16.8	159%
CN455	134.1	0.0163	0.013	Circle	2				28.84	25.13	25.13	37.2	148%
CN455	239.7	0.0162	0.013	Circle	2				28.78	25.13	25.13	37.2	148%
CN455	60.4	0.0189	0.013	Circle	2				31.08	25.13	25.13	37.2	148%
CN455	112.2	0.0066	0.013	Circle	2				18.37	25.13	18.37	37.2	203%
CN455	238.6	0.0060	0.013	Circle	2				17.57	25.13	17.57	37.2	212%
CN455	12.7	0.1815	0.024	Circle	2				52.20	25.13	25.13	37.2	148%
CN457	192.5	0.0060	0.013	Circle	2				17.56	25.13	17.56	43.3	247%
CN457	31.4	0.0064	0.013	Circle	2				18.04	25.13	18.04	43.3	240%
CN459	40.2	0.0065	0.013	Circle	1				2.87	6.28	2.87	7.4	258%

HMI_ID	Length	Slope	n	Shape	Diameter	Dim_1	Dim_2	Dim_3	$Cap_{Manning}$	Cap_{vel}	Capacity	Peak	% of Capacity
	ft	ft/ft			ft	ft	ft	h:v	cfs	cfs	cfs	cfs	
CN459	53.6	0.0827	0.024	Circle	1.25				10.06	9.82	9.82	7.4	75%
CN460	49.1	0.0687	0.013	Circle	1.25				16.93	9.82	9.82	23.2	236%
CN460	19.1	-0.0163	0.024	Circle	2				0.00	25.13	0.00	23.2	
CN460	59.8	0.0085	0.024	Circle	2				11.32	25.13	11.32	23.2	205%
CN460	342.8	0.0047	0.024	Circle	2				8.37	25.13	8.37	23.2	277%
CN461	69.6	0.0089	0.013	Circle	2				21.36	25.13	21.36	62.5	293%
CN461	126.5	0.0089	0.013	Circle	2				21.29	25.13	21.29	62.5	294%
CN463	373.6	0.0043	0.013	Circle	1.33				5.04	11.11	5.04	2.0	40%
CN463	30.8	0.0013	0.024	Circle	1.5				2.05	14.14	2.05	2.0	97%
CN463	94.9	0.0279	0.024	Circle	1.5				9.51	14.14	9.51	2.0	21%
CN463	392.7	0.0122	0.024	Circle	1.5				6.29	14.14	6.29	2.0	32%
CN463	115.5	0.0327	0.024	Circle	1.5				10.29	14.14	10.29	2.0	19%
CN463	60.7	-0.0443	0.013	Circle	1.5				0.00	14.14	0.00	2.0	
CN463	62.5	0.0506	0.024	Circle	1.5				12.80	14.14	12.80	2.0	16%
CN464	64.0	0.0037	0.013	Circle	2.17				17.15	29.59	17.15	1.9	11%
CN464	203.5	0.0045	0.013	Circle	2.17				18.73	29.59	18.73	1.9	10%
CN464	123.5	0.0061	0.013	Circle	2				17.63	25.13	17.63	1.9	11%
CN464	190.6	0.0091	0.013	Circle	2.17				26.76	29.59	26.76	1.9	7%
CN464	42.3	0.0062	0.013	Circle	2.33				26.76	34.11	26.76	1.9	7%
CN464	79.3	0.0052	0.013	Circle	2				16.26	25.13	16.26	1.9	12%
CN464	169.7	0.0081	0.013	Circle	2.17				25.17	29.59	25.17	1.9	8%
CN465	98.4	0.0063	0.013	Circle	1.5				8.34	14.14	8.34	13.2	158%
CN465	172.2	0.0045	0.013	Circle	1.5				7.03	14.14	7.03	13.2	188%
CN466	157.1	0.0073	0.013	Circle	3				57.07	70.69	57.07	17.1	30%
CN466	130.0	0.0024	0.013	Circle	3				32.57	70.69	32.57	17.1	52%
CN466	96.4	0.0074	0.013	Circle	3				57.25	70.69	57.25	17.1	30%
CN467	275.8	0.0099	0.013	Circle	3				66.24	70.69	66.24	19.6	30%
CN467	230.0	0.0089	0.013	Circle	3				62.81	70.69	62.81	19.6	31%
CN467	64.1	0.0115	0.013	Circle	3				71.65	70.69	70.69	19.6	28%
CN467	243.0	0.0079	0.013	Circle	3				59.28	70.69	59.28	19.6	33%
CN467	24.6	0.0134	0.013	Circle	3				77.22	70.69	70.69	19.6	28%
CN467	112.1	0.0115	0.013	Circle	3				71.56	70.69	70.69	19.6	28%
CN468	107.5	0.0046	0.013	Circle	2				15.27	25.13	15.27	26.5	173%
CN468	108.3	0.0045	0.013	Circle	2				15.22	25.13	15.22	26.5	174%
CN468	108.0	0.0045	0.013	Circle	2				15.24	25.13	15.24	26.5	174%
CN468	107.6	0.0046	0.013	Circle	2				15.27	25.13	15.27	26.5	173%
CN468	28.4	0.0039	0.024	Circle	4.33				59.97	147.25	59.97	105.9	177%
CN468	126.2	0.0037	0.024	Circle	4.33				58.79	147.25	58.79	105.9	180%
CN468	24.8	0.0036	0.024	Circle	4.33				58.00	147.25	58.00	105.9	183%
CN468	18.9	0.0048	0.024	Circle	4.33				66.39	147.25	66.39	105.9	160%
CN468	350.6	0.0045	0.024	Circle	4.33				64.46	147.25	64.46	105.9	164%
CN468	109.3	0.0044	0.024	Circle	4.33				63.82	147.25	63.82	105.9	166%
CN469	244.0	0.0058	0.024	Circle	4				59.15	125.66	59.15	116.1	196%
CN469	151.3	0.0057	0.024	Circle	4				59.00	125.66	59.00	116.1	197%
CN469	95.6	0.0037	0.024	Circle	4				47.09	125.66	47.09	116.1	247%
CN469	48.7	0.0037	0.024	Circle	4				47.30	125.66	47.30	116.1	245%
CN469	95.1	0.0037	0.024	Circle	4				47.20	125.66	47.20	116.1	246%
CN470	20.2	0.0040	0.024	Circle	4.33				60.56	147.25	60.56	117.5	194%
CN470	64.7	0.0070	0.024	Circle	4				64.91	125.66	64.91	117.5	181%
CN470	115.5	0.0070	0.024	Circle	4				65.16	125.66	65.16	117.5	180%
CN470	42.9	0.0070	0.024	Circle	4.33				80.55	147.25	80.55	117.5	146%
CN470	65.6	0.0069	0.024	Circle	4				64.46	125.66	64.46	117.5	182%
CN471	42.5	0.0035	0.024	Circle	4.33				57.23	147.25	57.23	126.0	220%
CN471	60.6	0.0036	0.024	Circle	4.33				58.02	147.25	58.02	126.0	217%
CN471	196.9	0.0037	0.024	Circle	4.33				58.25	147.25	58.25	126.0	216%
CN471	31.5	0.0003	0.024	Circle	4.33				17.17	147.25	17.17	126.0	734%
CN471	133.1	0.0002	0.024	Circle	4.33				11.81	147.25	11.81	126.0	1067%
CN471	38.5	0.0003	0.024	Circle	4.33				15.53	147.25	15.53	126.0	812%
CN471	42.5	0.0000	0.024	Circle	4.33				0.00	147.25	0.00	126.0	
CN472	97.2	0.0861	0.013	Circle	2				66.38	25.13	25.13	16.3	65%
CN472	95.3	0.0083	0.013	Circle	1.5				9.56	14.14	9.56	16.3	170%
CN473	247.4	0.0074	0.024	Circle	1.25				3.02	9.82	3.02	7.1	235%
CN473	84.2	0.0056	0.024	Circle	1.25				2.61	9.82	2.61	7.1	272%
CN473	364.7	0.0022	0.024	Circle	1.25				1.64	9.82	1.64	7.1	433%
CN473	170.0	0.0114	0.024	Circle	1.25				3.73	9.82	3.73	7.1	190%
CN474	335.6	0.0070	0.024	Circle	1.5				4.76	14.14	4.76	12.6	265%
CN474	296.1	0.0109	0.024	Circle	1.5				5.95	14.14	5.95	12.6	212%
CN474b	260.8	-0.0019	0.024	Circle	1.25				0.00	9.82	0.00	10.7	
CN474b	338.1	0.0038	0.024	Circle	1.25				2.17	9.82	2.17	10.7	493%
CN475	80.0	0.0046	0.024	Circle	4.33				65.49	147.25	65.49	140.7	215%
CN475	107.8	0.0045	0.024	Circle	4.33				64.93	147.25	64.93	140.7	217%
CN475	66.8	0.0117	0.024	Circle	4.33				104.07	147.25	104.07	140.7	135%
CN475	112.1	0.0045	0.024	Circle	4.33				64.96	147.25	64.96	140.7	217%
CN476	56.7	0.0009	0.024	Circle	4.33				28.60	147.25	28.60	143.3	501%
CN476	54.2	0.0009	0.024	Circle	4.33				29.25	147.25	29.25	143.3	490%
CN476	87.3	0.0023	0.024	Circle	5				67.52	196.35	67.52	143.3	212%

HMI_ID	Length	Slope	n	Shape	Diameter	Dim_1	Dim_2	Dim_3	$Cap_{Manning}$	Cap_{vel}	Capacity	Peak	% of Capacity
	ft	ft/ft			ft	ft	ft	h:v	cfs	cfs	cfs	cfs	
CN476	106.4	0.0009	0.024	Circle	4.33				29.53	147.25	29.53	143.3	485%
CN476	53.4	0.0122	0.024	Circle	4.33				106.28	147.25	106.28	143.3	135%
CN476	95.4	0.0007	0.024	Circle	5				38.21	196.35	38.21	143.3	375%
CN476	78.3	0.0022	0.024	Circle	4.33				44.89	147.25	44.89	143.3	319%
CN476	104.4	0.0008	0.024	Circle	4.33				26.66	147.25	26.66	143.3	537%
CN476	70.3	0.0058	0.024	Circle	4.33				73.55	147.25	73.55	143.3	195%
CN477	131.0	0.0023	0.024	Circle	5				67.50	196.35	67.50	153.5	227%
CN477	101.2	0.0023	0.024	Circle	4.33				45.91	147.25	45.91	153.5	334%
CN477	220.9	0.0029	0.024	Circle	5				75.33	196.35	75.33	153.5	204%
CN477	201.4	0.0022	0.024	Circle	5				66.68	196.35	66.68	153.5	230%
CN477	193.4	-0.0039	0.024	Circle	0				0.00	0	0.00	153.5	
CN477	14.4	0.2437	0.024	Circle	0				0.00	0	0.00	153.5	
CN478	454.9	0.0054	0.024	Circle	5				103.32	196.35	103.32	156.2	151%
CN478	110.3	0.0029	0.024	Circle	5				75.98	196.35	75.98	156.2	206%
CN478	217.5	-0.0148	0.024	Circle	5				0.00	196.35	0.00	156.2	
CN478	62.5	0.0054	0.024	Circle	5				104.04	196.35	104.04	156.2	150%
CN478	18.0	0.2109	0.013	Circle	0.67				5.55	2.82	2.82	0.0	0%
CN478	154.8	0.0028	0.024	Circle	5				75.22	196.35	75.22	156.2	208%
CN480	81.0	0.0009	0.024	Circle	1.5				1.67	14.14	1.67	7.0	419%
CN480	347.8	0.0032	0.024	Circle	1.5				3.21	14.14	3.21	7.0	218%
CN480	8.3	0.0000	0.024	Circle	1				0.00	6.28	0.00	7.0	
CN480	226.6	0.0029	0.024	Circle	1.5				3.07	14.14	3.07	7.0	228%
CN480	14.1	0.0644	0.024	Circle	1.25				8.88	9.82	8.88	7.0	79%
CN480	18.4	-0.0043	0.013	Circle	1.25				0.00	9.82	0.00	7.0	
CN480	16.5	-0.0213	0.024	Circle	1.25				0.00	9.82	0.00	7.0	
CN481	199.7	0.0050	0.024	Circle	2.5				15.72	49.09	15.72	35.2	224%
CN481	32.9	0.0316	0.024	Circle	3.33				85.09	87.09	85.09	35.2	41%
CN481	177.7	0.0018	0.013	Circle	2.5				17.41	49.09	17.41	35.2	202%
CN482	212.6	0.0082	0.024	Circle	2.5				20.16	49.09	20.16	44.6	221%
CN482	100.1	0.0037	0.013	Circle	1.25				3.93	9.82	3.93	44.6	1135%
CN482	237.1	0.0078	0.024	Circle	2.5				19.63	49.09	19.63	44.6	227%
CN482	233.4	0.0072	0.013	Circle	1.25				5.46	9.82	5.46	44.6	816%
CN482	212.7	0.0037	0.013	Circle	0				0.00	0	0.00	44.6	
CN482	101.7	0.0033	0.024	Circle	2.5				12.85	49.09	12.85	44.6	347%
CN483	112.2	0.0047	0.013	Circle	1.25				4.44	9.82	4.44	61.5	1385%
CN483	98.5	0.0031	0.024	Circle	3.33				26.84	87.09	26.84	61.5	229%
CN483	211.6	0.0015	0.024	Circle	3.33				18.61	87.09	18.61	61.5	331%
CN483	231.5	0.0054	0.024	Circle	2.5				16.33	49.09	16.33	61.5	377%
CN483	185.0	0.0054	0.024	Circle	2.5				16.33	49.09	16.33	61.5	377%
CN483	8.7	0.0426	0.013	Circle	2				46.69	25.13	25.13	61.5	245%
CN483	32.1	0.0031	0.024	Circle	2				6.84	25.13	6.84	61.5	899%
CN484	61.2	0.0029	0.013	Circle	3.5				53.78	96.21	53.78	94.9	176%
CN484	233.0	0.0028	0.013	Circle	3.5				53.60	96.21	53.60	94.9	177%
CN484	111.1	0.0034	0.013	Circle	4				83.33	125.66	83.33	94.9	114%
CN484	182.8	0.0093	0.013	Circle	4				138.69	125.66	125.66	94.9	76%
CN484	52.4	0.0028	0.024	Circle	3.5				0.00	96.21	0.00	94.9	
CN485	267.6	0.0044	0.013	Circle	4.5				129.86	159.04	129.86	102.5	79%
CN485	288.2	0.0048	0.013	Circle	4.5				135.80	159.04	135.80	102.5	75%
CN485	228.0	0.0037	0.013	Circle	4.5				119.20	159.04	119.20	102.5	86%
CN486	102.4	0.0049	0.013	Circle	3.5				70.36	96.21	70.36	70.6	100%
CN486	46.0	0.0049	0.013	Circle	3				46.58	70.69	46.58	47.1	101%
CN486	356.4	0.0048	0.013	Circle	4.5				136.44	159.04	136.44	116.8	86%
CN487	80.6	0.0693	0.024	Circle	2				32.27	25.13	25.13	2.5	10%
CN487	138.6	0.0029	0.013	Circle	5				141.13	196.35	141.13	121.0	86%
CN487	187.6	0.0025	0.013	Circle	5				130.93	196.35	130.93	121.0	92%
CN487	126.3	0.0119	0.013	Circle	3				72.86	70.69	70.69	51.7	73%
CN487	199.1	0.0025	0.013	Circle	3.5				50.30	96.21	50.30	51.7	103%
CN487	68.8	0.0055	0.012	Circle	3.5				80.96	96.21	80.96	68.1	84%
CN487	139.6	0.0029	0.013	Circle	4.5				105.70	159.04	105.70	119.8	113%
CN487	114.6	0.0043	0.013	Circle	3				43.62	70.69	43.62	51.7	118%
CN487	349.8	0.0010	0.025	Trapezoid	0	8	1	1	999.00	90	999.00	121.0	12%
CN487	96.4	-0.0021	0.024	Circle	4.33				0.00	147.25	0.00	121.0	
CN487	17.3	0.0513	0.025	Trapezoid	0	8	1	1	107.13	90	107.13	121.0	113%
CN487	25.0	0.0044	0.013	Circle	3.5				66.74	96.21	66.74	68.1	102%
CN488	160.4	0.0027	0.013	Circle	1.25				3.38	9.82	3.38	3.8	112%
CN488	151.0	0.0014	0.013	Circle	1.25				2.41	9.82	2.41	3.8	158%
CN488	124.7	0.0039	0.013	Circle	1.25				4.05	9.82	4.05	3.8	94%
CN488	104.1	0.0190	0.013	Circle	1.25				8.91	9.82	8.91	3.8	43%
CN488	123.6	0.0182	0.013	Circle	1				4.81	6.28	4.81	3.8	79%
CN488	206.4	0.0095	0.013	Circle	1.25				6.31	9.82	6.31	3.8	60%
CN488	130.1	0.0012	0.013	Circle	1.25				2.19	9.82	2.19	3.8	173%
CN488	76.3	0.0012	0.013	Circle	1.25				2.22	9.82	2.22	3.8	171%
CN489	38.3	-0.0138	0.013	Circle	2				0.00	25.13	0.00	24.5	
CN489	22.7	-0.0070	0.013	Circle	2				0.00	25.13	0.00	24.5	
CN489	7.2	0.0445	0.013	Circle	2				47.72	25.13	25.13	24.5	97%
CN489	233.8	0.0055	0.013	Circle	2				16.74	25.13	16.74	24.5	146%

HMI_ID	Length	Slope	n	Shape	Diameter	Dim_1	Dim_2	Dim_3	$Cap_{Manning}$	Cap_{vel}	Capacity	Peak	% of Capacity
	ft	ft/ft			ft	ft	ft	h:v	cfs	cfs	cfs	cfs	
CN489	236.5	0.0038	0.013	Circle	2				13.96	25.13	13.96	24.5	176%
CN489	282.8	0.0003	0.013	Circle	2				4.04	25.13	4.04	24.5	607%
CN491	31.9	0.0119	0.013	Circle	2				24.71	25.13	24.71	37.8	153%
CN491	171.2	-0.0009	0.013	Circle	2				0.00	25.13	0.00	37.8	
CN492	89.1	-0.0318	0.013	Circle	2				0.00	25.13	0.00	70.1	
CN492	36.0	0.0533	0.013	Circle	1.25				14.92	9.82	9.82	70.1	714%
CN492	463.6	0.0060	0.013	Circle	2				17.55	25.13	17.55	70.1	399%
CN492	44.7	0.0535	0.013	Circle	2				52.31	25.13	25.13	70.1	279%
CN493	155.8	-0.0006	0.013	Circle	1.5				0.00	14.14	0.00	15.5	
CN493	95.3	-0.0007	0.013	Circle	1.5				0.00	14.14	0.00	15.5	
CN493	234.0	0.0006	0.013	Circle	1.5				2.48	14.14	2.48	15.5	626%
CN493	92.0	0.0062	0.013	Circle	1.25				5.08	9.82	5.08	15.5	305%
CN493	53.1	0.0339	0.013	Circle	1.5				19.34	14.14	14.14	15.5	110%
CN494	212.3	0.0081	0.013	Circle	2				20.30	25.13	20.30	81.5	401%
CN494	6.5	-0.0612	0.013	Rectangle	0	5	9		0.00	450	0.00	81.5	
CN494	238.9	-0.0003	0.013	Circle	2				0.00	25.13	0.00	81.5	
CN494	20.0	0.0140	0.013	Circle	2				26.75	25.13	25.13	81.5	324%
CN494	147.9	-0.0003	0.013	Circle	2				0.00	25.13	0.00	81.5	
CN495	15.8	0.2554	0.013	Circle	1.25				32.65	9.82	9.82	2.2	22%
CN495	56.4	-0.0600	0.013	Circle	1.25				0.00	9.82	0.00	2.2	
CN496	91.6	0.0038	0.013	Squash	0	1.8333333	1.25		6.53	14.4	6.53	3.0	46%
CN496	164.1	0.0037	0.013	Squash	0	1.8333333	1.25		6.45	14.4	6.45	3.0	47%
CN496	167.1	0.0038	0.013	Circle	1.5				6.45	14.14	6.45	3.0	47%
CN497	217.4	0.0028	0.024	Circle	1.5				3.01	14.14	3.01	2.8	93%
CN497	411.7	0.0150	0.024	Circle	1.5				6.97	14.14	6.97	2.8	40%
CN497	196.8	0.0028	0.024	Circle	1.5				3.03	14.14	3.03	2.8	92%
CN497	14.8	0.0556	0.013	Circle	1.5				24.76	14.14	14.14	2.8	20%
CN497	125.2	0.0030	0.024	Circle	2				6.75	25.13	6.75	2.8	41%
CN497	11.0	0.0803	0.013	Circle	1.5				29.76	14.14	14.14	2.8	20%
CN497	344.9	0.0150	0.024	Circle	2				15.02	25.13	15.02	2.8	19%
CN497	87.3	0.0027	0.024	Circle	1.5				2.98	14.14	2.98	2.8	94%
CN497	116.8	0.0054	0.024	Circle	1.5				4.18	14.14	4.18	2.8	67%
CN497	74.3	0.0585	0.013	Circle	1				8.62	6.28	6.28	2.8	45%
CN498	56.4	-0.0012	0.013	Circle	1.25				0.00	9.82	0.00	2.5	
CN498	137.8	0.0086	0.013	Circle	0.83				2.03	4.33	2.03	2.5	123%
CN498	71.2	0.0326	0.016	Circle	1				5.23	6.28	5.23	2.5	48%
CN498	267.5	0.0042	0.013	Circle	1				2.31	6.28	2.31	2.5	108%
CN498	57.9	-0.0409	0.013	Circle	1.25				0.00	9.82	0.00	2.5	
CN498	117.5	0.0060	0.013	Circle	1.25				5.02	9.82	5.02	2.5	50%
CN498	138.8	0.0184	0.016	Circle	1				3.93	6.28	3.93	2.5	64%
CN498	67.2	-0.0104	0.013	Circle	1.25				0.00	9.82	0.00	2.5	
CN500	111.7	0.0107	0.013	Circle	2				23.45	25.13	23.45	31.8	136%
CN500	546.7	-0.0003	0.013	Circle	2				0.00	25.13	0.00	31.8	
CN501	170.4	0.0072	0.013	Circle	1.5				8.89	14.14	8.89	9.7	109%
CN501	166.9	-0.0009	0.013	Circle	1.5				0.00	14.14	0.00	9.7	
CN501	49.2	0.0087	0.013	Circle	1.5				9.82	14.14	9.82	9.7	99%
CN501	14.9	0.0074	0.013	Circle	1.5				9.02	14.14	9.02	9.7	108%
CN502	74.8	0.0130	0.013	Circle	1.25				7.36	9.82	7.36	2.4	33%
CN502	221.3	0.0129	0.013	Circle	1.25				7.34	9.82	7.34	2.4	33%
CN502	62.1	0.0285	0.013	Circle	1.17				9.07	8.6	8.60	2.4	28%
CN502	337.1	0.0086	0.013	Circle	1.25				6.00	9.82	6.00	2.4	40%
CN504	218.4	-0.0031	0.013	Circle	2				0.00	25.13	0.00	2.2	
CN504	64.5	0.0166	0.013	Circle	2				29.15	25.13	25.13	2.2	9%
CN504	37.7	0.0167	0.013	Circle	2				29.25	25.13	25.13	2.2	9%
CN505	296.5	0.0067	0.024	Circle	1.25				2.87	9.82	2.87	17.7	617%
CN506	77.7	0.0319	0.024	Circle	1.25				6.25	9.82	6.25	17.0	272%
CN506	154.1	0.0086	0.024	Circle	1.25				3.24	9.82	3.24	17.0	525%
CN507	480.2	0.0000	0.013	Circle	2				0.00	25.13	0.00	164.7	
CN507	24.1	0.0220	0.013	Circle	2				33.58	25.13	25.13	164.7	655%
CN507	33.4	0.1830	0.013	Trapezoid	0	13	1	1	601.52	140	601.52	164.7	27%
CN507	507.5	0.0002	0.025	Trapezoid	0	13	1	1	999.00	140	999.00	164.7	16%
CN507	25.4	-0.0182	0.013	Circle	2				0.00	25.13	0.00	164.7	
CN508	180.3	0.0155	0.013	Circle	1.25				8.04	9.82	8.04	2.4	30%
CN508	27.4	0.0026	0.013	Circle	1.25				3.26	9.82	3.26	2.4	74%
CN508	268.9	-0.0043	0.013	Circle	1.25				0.00	9.82	0.00	2.4	
CN510	298.5	0.0104	0.013	Circle	1.5				10.71	14.14	10.71	15.0	140%
CN510	101.8	0.0075	0.013	Circle	1.5				9.08	14.14	9.08	15.0	165%
CN511	129.3	0.0060	0.013	Circle	1.5				8.16	14.14	8.16	17.5	215%
CN511	544.2	0.0078	0.013	Circle	1.5				9.28	14.14	9.28	17.5	189%
CN513	30.2	0.0007	0	Circle	0				0.00	0	0.00	0.0	
CN514	392.5	0.0058	0.013	Circle	1.25				4.91	9.82	4.91	6.8	138%
CN514	332.3	0.0058	0.013	Circle	1.25				4.91	9.82	4.91	6.8	138%
CN514	203.1	0.0058	0.013	Circle	1.25				4.92	9.82	4.92	6.8	138%
CN514	57.6	0.0061	0.013	Circle	2				17.63	25.13	17.63	6.8	39%
CN517	36.6	0.0098	0.024	Circle	2				12.15	25.13	12.15	2.5	21%
CN517	49.4	0.0235	0.024	Circle	2				18.78	25.13	18.78	2.5	13%

HMI_ID	Length	Slope	n	Shape	Diameter	Dim_1	Dim_2	Dim_3	$Cap_{Manning}$	Cap_{vel}	Capacity	Peak	% of Capacity
	ft	ft/ft			ft	ft	ft	h:v	cfs	cfs	cfs	cfs	
CN517	69.0	0.0097	0.024	Circle	2				12.07	25.13	12.07	2.5	21%
CN517	276.3	-0.0021	0.024	Circle	2				0.00	25.13	0.00	2.5	
CN519	16.3	0.0000	0.024	Circle	1.5				0.00	14.14	0.00	5.7	
CN519	98.2	0.0000	0.024	Circle	1.5				0.00	14.14	0.00	5.7	
CN519	96.8	0.0000	0.024	Circle	1.5				0.00	14.14	0.00	5.7	
CN519	134.1	0.0000	0.024	Circle	1.5				0.00	14.14	0.00	5.7	
CN519	109.5	0.0000	0.024	Circle	1.5				0.00	14.14	0.00	5.7	
CN520	360.7	0.0057	0.013	Circle	2				17.14	25.13	17.14	5.0	29%
CN521	167.1	0.0118	0.013	Circle	2				24.56	25.13	24.56	8.8	36%
CN521	55.9	0.0118	0.013	Circle	1.5				11.41	14.14	11.41	8.8	77%
CN521	144.7	0.0601	0.013	Circle	1.5				25.75	14.14	14.14	8.8	62%
CN521	100.2	0.0642	0.013	Circle	1.5				26.62	14.14	14.14	8.8	62%
CN522	146.4	0.0818	0.013	Circle	1.5				30.05	14.14	14.14	12.4	88%
CN522	32.9	0.0128	0.013	Circle	2				25.54	25.13	25.13	12.4	49%
CN522	17.8	0.0129	0.013	Circle	2				25.68	25.13	25.13	12.4	49%
CN522	102.7	0.0143	0.013	Circle	2				27.06	25.13	25.13	12.4	49%
CN522	26.9	0.0494	0.013	Circle	4				319.17	125.66	125.66	12.4	10%
CN522	162.4	0.0129	0.013	Circle	4				163.33	125.66	125.66	12.4	10%
CN523	64.3	0.0000	0.024	Circle	1.25				0.00	9.82	0.00	3.6	
CN523	76.8	0.0000	0.013	Circle	1.25				0.00	9.82	0.00	3.6	
CN523	59.0	0.0000	0.013	Circle	1.25				0.00	9.82	0.00	3.6	
CN523	62.7	0.0000	0.024	Circle	1.25				0.00	9.82	0.00	3.6	
CN524	66.0	0.0301	0.024	Circle	1				3.35	6.28	3.35	3.3	98%
CN524	107.7	0.0642	0.024	Circle	1				4.89	6.28	4.89	3.3	68%
CN524	163.1	0.0300	0.016	Circle	0.67				1.70	2.82	1.70	3.3	194%
CN525	179.1	0.0029	0.013	Circle	2.5				22.10	49.09	22.10	27.5	124%
CN525	332.1	0.0053	0.013	Circle	2.5				29.95	49.09	29.95	27.5	92%
CN525	70.9	-0.0078	0.013	Circle	2.5				0.00	49.09	0.00	27.5	
CN525	233.8	0.0086	0.013	Circle	3				61.99	70.69	61.99	27.5	44%
CN525	71.3	0.0275	0.013	Circle	2.5				67.99	49.09	49.09	27.5	56%
CN526	57.3	-0.0002	0.013	Circle	1.25				0.00	9.82	0.00	3.4	
CN526	256.4	0.0116	0.013	Circle	1.25				6.96	9.82	6.96	3.4	49%
CN527	13.0	0.1636	0.024	Circle	1.5				23.01	14.14	14.14	17.5	124%
CN527	45.7	0.0636	0.013	Circle	1.5				26.50	14.14	14.14	17.5	124%
CN528	66.5	0.0478	0.013	Circle	1				7.79	6.28	6.28	7.3	116%
CN528	209.4	0.0146	0.016	Circle	0.67				1.19	2.82	1.19	7.3	615%
CN528	106.1	0.0028	0.013	Circle	1				1.89	6.28	1.89	7.3	385%
CN528	80.6	-0.0043	0.024	Circle	1				0.00	6.28	0.00	7.3	
CN528	61.7	0.0083	0.024	Circle	1				1.75	6.28	1.75	7.3	416%
CN529	264.7	0.0451	0.013	Circle	1.25				13.72	9.82	9.82	2.3	23%
CN529	218.6	0.0112	0.013	Circle	1.25				6.83	9.82	6.83	2.3	34%
CN529	311.4	0.0066	0.013	Circle	1.25				5.23	9.82	5.23	2.3	44%
CN529	174.2	0.0096	0.013	Circle	1.5				10.28	14.14	10.28	2.3	22%
CN529	108.8	0.0254	0.013	Circle	1.25				10.29	9.82	9.82	2.3	23%
CN529	240.9	0.0112	0.013	Circle	1.25				6.83	9.82	6.83	2.3	34%
CN530	50.2	0.0036	0.013	Circle	1.5				6.29	14.14	6.29	0.0	0%
CN530	91.2	0.0050	0.013	Circle	1.5				7.46	14.14	7.46	0.0	0%
CN530	237.7	0.0051	0.013	Circle	1.5				7.49	14.14	7.49	0.0	0%
CN530	55.0	0.0035	0.013	Circle	1.5				6.18	14.14	6.18	0.0	0%
CN531	40.8	0.0007	0.013	Circle	1.5				2.85	14.14	2.85	3.7	130%
CN531	228.1	0.0217	0.013	Circle	1.5				15.46	14.14	14.14	3.7	26%
CN531	149.3	0.0217	0.013	Circle	1.5				15.48	14.14	14.14	3.7	26%
CN531	282.1	0.0193	0.013	Circle	2				31.41	25.13	25.13	3.7	15%
CN531	43.1	0.0104	0.013	Circle	1.5				10.73	14.14	10.73	3.7	34%
CN531	37.6	0.0048	0.013	Circle	2				15.66	25.13	15.66	3.7	24%
CN532	302.1	0.0246	0.013	Circle	2				35.50	25.13	25.13	5.1	20%
CN532	235.3	0.0003	0.013	Circle	2				3.61	25.13	3.61	5.1	141%
CN533	50.8	0.0037	0.013	Circle	3.67				69.63	105.78	69.63	50.4	72%
CN533	138.3	0.0037	0.013	Circle	3.67				69.16	105.78	69.16	50.4	73%
CN533	34.6	0.0124	0.013	Circle	3.67				127.00	105.78	105.78	50.4	48%
CN533	91.9	0.0350	0.013	Circle	3				124.83	70.69	70.69	50.4	71%
CN533	149.8	0.0134	0.013	Circle	3				77.26	70.69	70.69	50.4	71%
CN533	100.7	0.0037	0.013	Circle	3.67				69.03	105.78	69.03	50.4	73%
CN533	4.8	0.0041	0.013	Circle	3.67				73.19	105.78	73.19	50.4	69%
CN534	15.3	0.2078	0.013	Circle	1.5				47.89	14.14	14.14	55.2	390%
CN534	216.5	0.0042	0.013	Circle	4.5				126.78	159.04	126.78	55.2	44%
CN534	92.6	0.0041	0.013	Circle	4.5				125.99	159.04	125.99	55.2	44%
CN536	108.0	0.0048	0.013	Circle	1.25				4.48	9.82	4.48	12.1	270%
CN536	49.7	0.0034	0.024	Circle	1				1.13	6.28	1.13	12.1	1072%
CN536	243.0	0.0049	0.013	Circle	1.25				4.50	9.82	4.50	12.1	269%
CN537	98.6	0.0034	0.013	Circle	1				2.09	6.28	2.09	4.9	234%
CN537	66.4	0.0024	0.024	Circle	1				0.95	6.28	0.95	4.9	517%
CN537	157.7	0.0085	0.013	Circle	1				3.28	6.28	3.28	4.9	149%
CN538	228.0	0.0052	0.013	Circle	1.25				4.65	9.82	4.65	3.5	75%
CN538	58.7	0.0164	0.013	Circle	1.25				8.26	9.82	8.26	3.5	42%
CN538	259.0	0.0125	0.013	Circle	1.25				7.21	9.82	7.21	3.5	49%

HMI_ID	Length	Slope	n	Shape	Diameter	Dim_1	Dim_2	Dim_3	$Cap_{Manning}$	Cap_{vel}	Capacity	Peak	% of Capacity
	ft	ft/ft			ft	ft	ft	h:v	cfs	cfs	cfs	cfs	
CN538	276.4	0.0046	0.013	Circle	1.25				4.36	9.82	4.36	3.5	80%
CN540	284.4	0.0213	0.013	Circle	1.5				15.33	14.14	14.14	59.2	419%
CN540	322.4	0.0137	0.013	Circle	1.5				12.31	14.14	12.31	59.2	481%
CN540	278.1	0.0167	0.013	Circle	1.5				13.57	14.14	13.57	59.2	436%
CN545	164.0	0.0032	0.024	Circle	2.5				12.63	49.09	12.63	5.2	41%
CN545	130.9	0.0076	0.024	Circle	2.5				19.42	49.09	19.42	5.2	27%
CN545	45.7	0.0158	0.013	Circle	2.5				51.51	49.09	49.09	5.2	11%
CN545	92.5	0.0068	0.013	Circle	1.5				8.67	14.14	8.67	5.2	60%
CN545	42.4	0.0127	0.013	Circle	1.5				11.86	14.14	11.86	5.2	44%
CN545	380.8	0.0029	0.013	Circle	1.5				5.65	14.14	5.65	5.2	92%
CN546	97.4	0.0102	0.013	Circle	3				67.26	70.69	67.26	59.8	89%
CN546	163.5	0.0149	0.013	Circle	3				81.47	70.69	70.69	59.8	85%
CN546	325.4	0.0028	0.013	Rectangle	0	4	3		65.82	120	65.82	59.8	91%
CN546	56.9	0.0091	0.013	Circle	3				63.73	70.69	63.73	59.8	94%
CN546	156.4	0.0091	0.013	Circle	3				63.77	70.69	63.77	59.8	94%
CN546	31.0	0.0142	0.013	Circle	3				79.52	70.69	70.69	59.8	85%
CN547	169.0	0.0028	0.013	Rectangle	0	4	3		65.95	120	65.95	75.5	114%
CN547	68.1	0.0062	0.013	Rectangle	0	4	3		97.20	120	97.20	75.5	78%
CN547	303.1	0.0083	0.013	Rectangle	0	4	3		112.63	120	112.63	75.5	67%
CN548	499.0	0.0040	0.024	Circle	4				49.50	125.66	49.50	31.4	63%
CN548	491.6	0.0049	0.024	Circle	4				54.25	125.66	54.25	31.4	58%
CN548	500.3	0.0051	0.024	Circle	4				55.77	125.66	55.77	31.4	56%
CN548b	114.7	0.0033	0.013	Circle	2				13.02	25.13	13.02	42.5	326%
CN548b	30.8	0.0045	0.013	Circle	2				15.25	25.13	15.25	57.8	379%
CN548b	70.7	0.0091	0.013	Circle	2				21.53	25.13	21.53	42.5	197%
CN548b	185.8	0.0047	0.013	Circle	2				15.57	25.13	15.57	42.5	273%
CN548b	77.3	0.0050	0.013	Circle	2				16.07	25.13	16.07	42.5	264%
CN548b	148.6	-0.0046	0.013	Circle	2				0.00	25.13	0.00	42.5	
CN548b	313.4	0.0032	0.013	Circle	2				12.78	25.13	12.78	42.5	333%
CN548b	126.4	0.0047	0.013	Circle	2				15.45	25.13	15.45	42.5	275%
CN548b	31.9	0.0245	0.013	Circle	2				35.40	25.13	25.13	42.5	169%
CN551	347.3	0.0048	0.024	Circle	4				54.12	125.66	54.12	31.5	58%
CN551	115.0	0.0078	0.024	Circle	4				68.85	125.66	68.85	31.5	46%
CN554	14.6	0.0014	0.013	Circle	2.5				15.16	49.09	15.16	0.0	0%
CN554	90.6	0.0781	0.013	Circle	2.5				114.65	49.09	49.09	0.0	0%
CN555	138.9	0.0860	0.013	Circle	2				66.34	25.13	25.13	29.8	119%
CN555	308.7	0.0034	0.013	Circle	2.5				23.92	49.09	23.92	29.8	125%
CN555	63.5	-0.0162	0.013	Circle	2				0.00	25.13	0.00	29.8	
CN555	31.3	-0.0549	0.013	Circle	2				0.00	25.13	0.00	29.8	
CN555	107.8	-0.0041	0.013	Circle	2.5				0.00	49.09	0.00	29.8	
CN555	200.9	0.0160	0.013	Circle	2				28.64	25.13	25.13	29.8	119%
CN555	22.7	-0.0128	0.013	Circle	2				0.00	25.13	0.00	29.8	
CN555	24.9	0.0861	0.024	Circle	1				5.66	6.28	5.66	29.8	526%
CN555	174.9	0.0046	0.013	Circle	2				15.30	25.13	15.30	29.8	195%
CN556	276.9	0.0095	0.013	Circle	2.5				39.90	49.09	39.90	29.8	75%
CN556	177.1	0.0030	0.013	Circle	2.5				22.65	49.09	22.65	29.8	132%
CN556	242.8	0.0092	0.013	Circle	2.5				39.31	49.09	39.31	29.8	76%
CN556	30.3	-0.0026	0.013	Circle	2.5				0.00	49.09	0.00	29.8	
CN556	112.0	0.0079	0.013	Circle	2.5				36.36	49.09	36.36	29.8	82%
CN556	260.6	0.0068	0.013	Circle	2.5				33.71	49.09	33.71	29.8	88%
CN556	220.9	0.0082	0.013	Circle	2.5				37.23	49.09	37.23	29.8	80%
CN562	37.1	0.0032	0.025	Trapezoid	0	0	1	2	10.73	32	10.73	0.0	0%
CN562	212.0	0.0032	0.025	Trapezoid	0	0	1	2	10.68	32	10.68	0.0	0%
CN562	95.2	0.0033	0.024	Circle	2				6.99	25.13	6.99	0.0	0%
CN562	105.6	0.0759	0.024	Circle	1.5				15.68	14.14	14.14	0.0	0%
CN562	150.9	0.1875	0.024	Circle	1.5				24.64	14.14	14.14	0.0	0%
CN562	34.9	0.0776	0.024	Circle	1.5				15.85	14.14	14.14	0.0	0%
CN562	83.8	0.0451	0.024	Circle	1.5				12.09	14.14	12.09	0.0	0%
CN562	33.5	0.0039	0.024	Circle	1.5				3.54	14.14	3.54	0.0	0%
CN572	74.2	-0.0667	0.013	Circle	3				0.00	70.69	0.00	27.1	
CN572	117.4	-0.0153	0.025	Trapezoid	0	4	1	3	0.00	210	0.00	27.1	
CN572	3.0	0.9305	0.025	Trapezoid	0	4	1	3	1702.98	210	1702.98	27.1	2%
CN572	6.4	0.0478	0.013	Rectangle	0	6	3		449.71	180	180.00	27.1	15%
CN572	14.9	-0.0054	0.013	Rectangle	0	6	3		0.00	180	0.00	27.1	
CN572	4.8	-0.1454	0.013	Rectangle	0	6	6		0.00	360	0.00	27.1	
CN572	24.3	0.2321	0.013	Circle	3				321.33	70.69	70.69	27.1	38%
CN572	33.9	-0.0018	0.013	Circle	3				0.00	70.69	0.00	27.1	
CN572	23.6	0.0072	0.013	Rectangle	0	6	3		174.58	180	174.58	27.1	16%
CN572	333.1	0.0108	0.025	Trapezoid	0	4	1	3	183.47	210	183.47	27.1	15%
CN572	15.3	0.1455	0.013	Rectangle	0	6	2.5		601.65	150	150.00	27.1	18%
CN584	344.6	0.0081	0.024	Circle	1				1.74	6.28	1.74	6.8	391%
CN584	442.5	0.0146	0.013	Circle	1				4.30	6.28	4.30	6.8	158%
CN584	189.5	0.0018	0.013	Circle	1				1.51	6.28	1.51	6.8	451%
CN587	521.0	0.0116	0.013	Circle	2				24.34	25.13	24.34	8.3	34%
CN587	58.5	0.0132	0.013	Circle	2				25.95	25.13	25.13	8.3	33%
CN61	63.8	0.0163	0.013	Circle	3				85.13	70.69	70.69	65.9	93%

HMI_ID	Length	Slope	n	Shape	Diameter	Dim_1	Dim_2	Dim_3	$Cap_{Manning}$	Cap_{vel}	Capacity	Peak	% of Capacity
	ft	ft/ft			ft	ft	ft	h:v	cfs	cfs	cfs	cfs	
CN61	446.8	0.0059	0.013	Circle	3				51.17	70.69	51.17	65.9	129%
CN61	421.7	0.0277	0.013	Circle	3				111.05	70.69	70.69	65.9	93%
CN61	309.7	0.0344	0.013	Circle	3				123.62	70.69	70.69	65.9	93%
CN61	106.4	0.1097	0.013	Circle	3				220.88	70.69	70.69	65.9	93%
CN624b	170.7	0.0049	0.013	Circle	1.5				7.33	14.14	7.33	33.6	459%
CN624b	44.7	0.0049	0.013	Circle	1.25				4.53	9.82	4.53	33.6	742%
CN635	529.2	0.0057	0.013	Circle	2.5				30.99	49.09	30.99	90.4	292%
CN655	60.6	0.0083	0.024	Circle	1.5				5.17	14.14	5.17	9.3	180%
CN655	67.1	-0.0078	0.024	Squash	0	2.8333333	2		0.00	35.6	0.00	9.3	
CN655	171.7	0.0111	0.024	Squash	0	2.8333333	2		20.21	35.6	20.21	9.3	46%
CN656	305.0	0.0029	0.013	Circle	1.5				5.64	14.14	5.64	5.1	90%
CN656	46.9	-0.0041	0.013	Circle	1.5				0.00	14.14	0.00	5.1	
CN656	97.1	0.0011	0.013	Circle	1.5				3.54	14.14	3.54	5.1	144%
CV557	71.6	0.0175	0.013	Circle	0				0.00	0	0.00	73.3	
CV557	64.9	0.0176	0.013	Circle	3				88.39	70.69	70.69	73.3	104%
CV557	407.9	0.0285	0.013	Circle	3				112.67	70.69	70.69	73.3	104%
CV558	358.8	0.0059	0.013	Circle	3.5				77.51	96.21	77.51	72.7	94%
CV558	143.7	0.0209	0.013	Circle	3.5				145.61	96.21	96.21	72.7	76%
CV559	383.6	0.0009	0.013	Circle	2				6.93	25.13	6.93	30.1	434%
CV560	64.1	0.1403	0.025	Trapezoid	0	0	0.834	3	162.55	75.06	162.55	31.3	19%
CV560	55.4	-0.0422	0.024	Circle	3				0.00	70.69	0.00	31.3	
CV560	277.4	0.0044	0.025	Trapezoid	0	1	0.5	3	29.15	75	29.15	31.3	107%
CV561	47.1	0.0004	0.013	Circle	3				13.74	70.69	13.74	40.4	294%
CV561	58.9	0.0104	0.013	Circle	3				67.88	70.69	67.88	40.4	60%
CV561	238.6	0.0006	0.013	Circle	3				16.16	70.69	16.16	40.4	250%
CV562	229.0	-0.0002	0.013	Circle	2				0.00	25.13	0.00	9.6	
CV562	296.9	-0.0009	0.013	Circle	2				0.00	25.13	0.00	9.6	
CV562	285.4	0.0025	0.013	Circle	2				11.20	25.13	11.20	9.6	86%
CV562	16.8	-0.0048	0.013	Circle	2				0.00	25.13	0.00	9.6	
CV563	298.3	0.0020	0.013	Circle	2				10.06	25.13	10.06	9.6	95%
CV563	35.6	-0.0070	0.013	Circle	2				0.00	25.13	0.00	9.6	
CV563	19.1	0.0021	0.013	Circle	2				10.36	25.13	10.36	9.6	93%
CV563	166.4	0.0049	0.013	Circle	2				15.88	25.13	15.88	9.6	60%
CV564	135.7	0.0111	0.013	Circle	1.25				6.82	9.82	6.82	5.2	76%
CV564	166.3	0.0107	0.013	Circle	1.25				6.68	9.82	6.68	5.2	78%
CV565	197.2	0.0111	0.013	Circle	1.5				11.07	14.14	11.07	5.2	47%
CV565	124.6	0.0210	0.013	Circle	1.5				15.21	14.14	14.14	5.2	37%
CV565	155.9	0.0162	0.013	Circle	2				28.76	25.13	25.13	5.2	21%
CV566	354.3	0.0050	0.013	Circle	1.25				4.55	9.82	4.55	14.1	310%
CV566	276.7	0.0002	0.013	Circle	1.25				0.95	9.82	0.95	14.1	1482%
CV566	28.3	0.0095	0.013	Circle	1.25				6.31	9.82	6.31	14.1	223%
CV566	270.2	-0.0038	0.013	Circle	1.25				0.00	9.82	0.00	14.1	
CV567	19.6	-0.0112	0.013	Circle	1.25				0.00	9.82	0.00	14.4	
CV567	198.7	0.0243	0.024	Circle	1.25				5.45	9.82	5.45	14.4	264%
CV569	91.2	0.0197	0.025	Trapezoid	0	1	1	5	395.23	300	395.23	37.8	10%
CV571	70.4	0.0298	0.013	Circle	2				39.08	25.13	25.13	37.8	150%
CV571	136.7	-0.0067	0.013	Circle	2				0.00	25.13	0.00	37.8	
CV571	138.0	0.0064	0.013	Circle	2				18.06	25.13	18.06	37.8	209%
CV571	152.3	0.0319	0.013	Circle	2				40.37	25.13	25.13	37.8	150%
CV571	581.2	-0.0072	0.013	Circle	2				0.00	25.13	0.00	37.8	
CV571	17.8	0.0315	0.024	Circle	1.25				6.21	9.82	6.21	37.8	608%
CV572	196.0	0.0030	0.013	Circle	2				12.31	25.13	12.31	42.8	348%
CV572	109.4	0.0028	0.013	Circle	2				12.04	25.13	12.04	42.8	355%
CV572	59.3	0.0059	0.013	Circle	2				17.39	25.13	17.39	42.8	246%
CV572	233.2	0.0021	0.013	Circle	2				10.37	25.13	10.37	42.8	413%
CV573	392.8	0.0075	0.013	Circle	1.25				5.58	9.82	5.58	39.4	706%
CV574	70.5	-0.0072	0.013	Circle	1.5				0.00	14.14	0.00	9.6	
CV574	219.6	0.0020	0.013	Circle	1.5				4.65	14.14	4.65	9.6	207%
CV575	406.6	0.0028	0.013	Circle	1.5				5.56	14.14	5.56	11.5	207%
CV576	126.5	0.0224	0.013	Circle	1.25				9.68	9.82	9.68	8.2	85%
CV576	59.8	0.0085	0.013	Circle	1.25				5.97	9.82	5.97	8.2	137%
CV576	86.6	-0.0112	0.013	Circle	1.75				0.00	19.24	0.00	8.2	
CV576	143.8	-0.0111	0.013	Circle	1.5				0.00	14.14	0.00	8.2	
CV577	590.5	0.0026	0.024	Circle	1.75				4.37	19.24	4.37	14.9	341%
CV577	147.5	0.0024	0.013	Circle	1.5				5.19	14.14	5.19	14.9	287%
CV578	349.7	0.0226	0.013	Circle	2.25				46.58	31.81	31.81	5.3	17%
CV579	381.7	0.0046	0.013	Circle	2.25				20.97	31.81	20.97	7.6	36%
CV579	53.5	0.0134	0.013	Circle	2.25				35.91	31.81	31.81	7.6	24%
CV580	179.7	0.0071	0.013	Circle	1				3.00	6.28	3.00	3.2	107%
CV580	52.6	0.0017	0.013	Circle	1				1.47	6.28	1.47	3.2	217%
CV580	98.5	-0.0057	0.013	Circle	1				0.00	6.28	0.00	3.2	
CV580	25.2	0.0123	0.013	Circle	1				3.95	6.28	3.95	3.2	81%
CV580	29.1	-0.0062	0.013	Circle	1.25				0.00	9.82	0.00	3.2	
CV580	97.6	-0.0003	0.013	Circle	1.25				0.00	9.82	0.00	3.2	
CV580	82.8	0.0011	0.013	Circle	1.25				2.13	9.82	2.13	3.2	150%
CV580	31.6	0.0054	0.013	Circle	1.25				4.74	9.82	4.74	3.2	68%

HMI_ID	Length	Slope	n	Shape	Diameter	Dim_1	Dim_2	Dim_3	$Cap_{Manning}$	Cap_{vel}	Capacity	Peak	% of Capacity
	ft	ft/ft			ft	ft	ft	h:v	cfs	cfs	cfs	cfs	
CV580	256.3	0.0057	0.013	Circle	1.25				4.89	9.82	4.89	3.2	65%
CV581	353.7	0.0076	0.013	Circle	2				19.76	25.13	19.76	5.7	29%
CV581	66.6	0.2900	0.013	Circle	2				121.83	25.13	25.13	5.7	23%
CV581	98.5	0.0115	0.013	Circle	2				24.23	25.13	24.23	5.7	24%
CV581	141.8	0.0052	0.013	Circle	2				16.34	25.13	16.34	5.7	35%
CV581	23.2	0.0181	0.013	Circle	2				30.42	25.13	25.13	5.7	23%
CV581	120.7	0.0002	0.013	Circle	1.5				1.35	14.14	1.35	5.7	422%
CV582	53.0	0.0956	0.013	Circle	2				69.95	25.13	25.13	40.9	163%
CV582	2167.6	0.0098	0.013	Circle	3				65.95	70.69	65.95	40.9	62%
CV582	37.5	-0.0149	0.013	Circle	2				0.00	25.13	0.00	40.9	
CV582	963.8	-0.0066	0.013	Circle	3				0.00	70.69	0.00	40.9	
CV584	156.9	0.0208	0.013	Circle	3				96.28	70.69	70.69	14.5	21%
CV584	103.0	0.0065	0.013	Circle	3				53.81	70.69	53.81	14.5	27%
CV584	284.6	0.0057	0.013	Circle	3				50.17	70.69	50.17	14.5	29%
CV585	210.4	0.0047	0.013	Circle	3				45.76	70.69	45.76	17.4	38%
CV585	5.6	-0.0053	0.013	Rectangle	0	4	5.8333333		0.00	233.33	0.00	17.4	
CV585	116.9	0.0021	0.013	Circle	3				30.85	70.69	30.85	17.4	56%
CV586	70.0	0.0116	0.013	Circle	3				71.77	70.69	70.69	17.4	25%
CV586	100.8	0.0016	0.013	Circle	2.5				16.34	49.09	16.34	17.4	106%
CV586	23.3	0.0262	0.013	Circle	3				108.01	70.69	70.69	17.4	25%
CV586	18.5	0.0254	0.013	Circle	2				36.02	25.13	25.13	17.4	69%
CV587	187.3	0.0009	0	Circle	2.5				0.00	49.09	0.00	0.0	
CV587	30.0	0.0127	0	Circle	1.25				0.00	9.82	0.00	0.0	
CV587	143.4	0.0065	0.013	Circle	2.5				33.03	49.09	33.03	44.6	135%
CV589	91.5	0.0067	0.013	Circle	1.5				8.58	14.14	8.58	3.0	35%
CV589	247.7	0.0283	0.013	Circle	1.5				17.66	14.14	14.14	3.0	21%
CV589	501.0	0.0254	0.013	Circle	1.5				16.75	14.14	14.14	3.0	21%
CV589	5.3	0.0637	0.024	Circle	1.5				14.36	14.14	14.14	3.0	21%
CV589	150.7	0.0283	0.013	Circle	1.5				17.66	14.14	14.14	3.0	21%
CV589	80.3	0.0239	0.024	Circle	1.5				8.80	14.14	8.80	3.0	34%
CV589	62.4	0.0472	0.013	Circle	1.5				22.83	14.14	14.14	3.0	21%
CV589	70.1	0.0472	0.013	Circle	1.5				22.83	14.14	14.14	3.0	21%
CV589	25.7	0.2621	0.013	Circle	1.5				53.77	14.14	14.14	3.0	21%
CV591	70.3	-0.0330	0.013	Circle	1.25				0.00	9.82	0.00	9.2	
CV591	152.7	0.0103	0.024	Circle	1.5				5.77	14.14	5.77	9.2	159%
CV591	506.9	0.0036	0.013	Circle	1.25				3.89	9.82	3.89	9.2	236%
CV591	129.9	0.0269	0.013	Circle	1.25				10.59	9.82	9.82	9.2	94%
CV591	7.3	0.0288	0.024	Squash	0	1.75	1		6.65	11	6.65	9.2	138%
CV592	25.0	0.0048	0.013	Circle	0				0.00	0	0.00	6.0	
CV592	359.1	0.0011	0.025	Trapezoid	0	1	1	2	11.24	60	11.24	6.0	53%
CV592	40.0	0.0163	0.013	Circle	0				0.00	0	0.00	6.0	
CV593	872.6	0.0021	0.013	Trapezoid	0	1	1	2	28.98	60	28.98	6.6	23%
CV594	243.7	0.0067	0.013	Circle	1.25				5.28	9.82	5.28	4.1	78%
CV594	55.9	-0.0038	0.013	Circle	1.25				0.00	9.82	0.00	4.1	
CV603	403.6	0.0173	0.013	Circle	1				4.69	6.28	4.69	15.8	337%
CV603	68.0	0.0068	0.013	Circle	2				18.60	25.13	18.60	15.8	85%
CV603	179.1	0.0054	0.013	Circle	2				16.56	25.13	16.56	15.8	95%
CV603	9.3	0.3186	0.013	Circle	1.5				59.29	14.14	14.14	15.8	112%
CV603	45.2	0.0195	0.013	Circle	1				4.97	6.28	4.97	15.8	318%
CV605	435.9	0.0030	0.013	Circle	2				12.35	25.13	12.35	15.7	127%
CV607	107.2	-0.0006	0.013	Circle	1.25				0.00	9.82	0.00	0.0	
CV607	136.9	-0.0005	0.013	Circle	1.25				0.00	9.82	0.00	0.0	
CV607	181.6	-0.0005	0.013	Circle	1.25				0.00	9.82	0.00	0.0	
CV607	60.9	-0.0005	0.013	Rectangle	0	2	1		0.00	16	0.00	0.0	
CV608	283.4	0.0029	0.024	Circle	1.25				1.88	9.82	1.88	0.0	0%
CV608	128.0	0.0044	0.013	Circle	1.25				4.27	9.82	4.27	0.0	0%
CV608	376.7	0.0073	0.016	Circle	1.25				4.48	9.82	4.48	0.0	0%
CV608	171.5	0.0069	0.013	Circle	1.25				5.38	9.82	5.38	0.0	0%
CV608	30.5	0.1411	0.013	Circle	1.25				24.26	9.82	9.82	0.0	0%
CV608	160.3	0.0043	0.013	Circle	1.25				4.24	9.82	4.24	0.0	0%
CV608	241.6	0.0363	0.013	Circle	1.25				12.31	9.82	9.82	0.0	0%
CV608	44.0	0.0043	0.013	Circle	1.25				4.25	9.82	4.25	0.0	0%
CV612	10.5	0.0686	0.013	Circle	1.25				16.92	9.82	9.82	6.1	62%
CV612	64.7	0.0011	0.013	Circle	1.25				2.13	9.82	2.13	6.1	287%
CV612	138.0	0.0019	0.013	Circle	1.25				2.80	9.82	2.80	6.1	218%
CV613	222.0	-0.0009	0.013	Circle	2				0.00	25.13	0.00	15.2	
CV616	8.0	0.1119	0	Circle	1				0.00	6.28	0.00	0.0	
CV616	250.8	0.0032	0.013	Circle	1.5				5.93	14.14	5.93	9.6	162%
CV617	8.1	0.1285	0	Circle	1.25				0.00	9.82	0.00	0.0	
CV617	55.4	0.0032	0.013	Circle	1.5				5.99	14.14	5.99	13.9	232%
CV617	68.5	0.0174	0.013	Circle	1.5				13.84	14.14	13.84	13.9	100%
CV617	113.7	0.0032	0.013	Circle	1.5				5.91	14.14	5.91	13.9	235%
CV617	113.5	0.0050	0.013	Circle	1.5				7.45	14.14	7.45	13.9	187%
CV621	145.4	0.0091	0.013	Circle	5				249.11	196.35	196.35	183.9	94%
CV621	25.3	0.0055	0.013	Circle	5				193.64	196.35	193.64	183.9	95%
CV621	81.5	0.0043	0.013	Circle	5				170.66	196.35	170.66	183.9	108%

HMI_ID	Length	Slope	n	Shape	Diameter	Dim_1	Dim_2	Dim_3	$Cap_{Manning}$	Cap_{vel}	Capacity	Peak	% of Capacity
	ft	ft/ft			ft	ft	ft	h:v	cfs	cfs	cfs	cfs	
CV621	210.3	0.0043	0.013	Circle	5				170.36	196.35	170.36	183.9	108%
CV621	63.3	-0.0005	0.013	Circle	5				0.00	196.35	0.00	183.9	
CV621	160.3	-0.0005	0.013	Circle	5				0.00	196.35	0.00	183.9	
CV622	45.4	0.0042	0.013	Circle	5				168.51	196.35	168.51	197.6	117%
CV622	53.4	0.0174	0.013	Circle	4				189.54	125.66	125.66	197.6	157%
CV622	147.0	0.0274	0.013	Circle	4				237.57	125.66	125.66	197.6	157%
CV622	279.1	0.0042	0.013	Circle	5				169.33	196.35	169.33	197.6	117%
CV622	206.8	0.0173	0.013	Circle	4				188.73	125.66	125.66	197.6	157%
CV622	286.7	0.0033	0.013	Circle	5				150.71	196.35	150.71	197.6	131%
CV622	120.8	0.0043	0.013	Circle	5				170.86	196.35	170.86	197.6	116%
CV623	305.6	0.0261	0.013	Circle	4				232.11	125.66	125.66	200.1	159%
CV624	122.7	0.0141	0.013	Circle	4				170.56	125.66	125.66	200.0	159%
CV624	116.1	-0.0332	0.013	Circle	4				0.00	125.66	0.00	200.0	
CV628	64.1	0.0028	0.013	Circle	2				11.99	25.13	11.99	16.0	133%
CV628	128.6	0.0097	0.013	Circle	2				22.30	25.13	22.30	16.0	72%
CV628	34.9	-0.0504	0.013	Circle	2				0.00	25.13	0.00	16.0	
CV628	29.7	0.0050	0.013	Circle	2				16.07	25.13	16.07	16.0	100%
CV628	52.3	0.0023	0.013	Circle	2				10.84	25.13	10.84	16.0	148%
CV628	39.7	0.0005	0.013	Circle	2				5.08	25.13	5.08	16.0	315%
CV628	247.4	0.0009	0.013	Circle	2				6.75	25.13	6.75	16.0	237%
CV628	30.1	0.0786	0.013	Circle	2				63.44	25.13	25.13	16.0	64%
CV629	99.5	0.0048	0.013	Circle	2.5				28.49	49.09	28.49	15.9	56%
CV629	111.5	0.0048	0.013	Circle	2.5				28.27	49.09	28.27	15.9	56%
CV629	42.8	0.0173	0.013	Circle	2.5				53.92	49.09	49.09	15.9	32%
CV629	55.9	0.0186	0.013	Circle	2.5				55.95	49.09	49.09	15.9	32%
CV629	4.4	0.0315	0.013	Rectangle	0	4	4.5833333		388.55	183.33	183.33	15.9	9%
CV629	206.9	0.0107	0.013	Circle	2.5				42.39	49.09	42.39	15.9	38%
CV629	60.4	0.0048	0.013	Circle	2.5				28.41	49.09	28.41	15.9	56%
CV629	145.8	0.0440	0.013	Circle	2.5				86.02	49.09	49.09	15.9	32%
CV629	53.1	0.1061	0.013	Circle	2.5				133.59	49.09	49.09	15.9	32%
CV630	822.6	0.0078	0.025	Trapezoid	0	6	1	3	214.36	270	214.36	31.1	15%
CV631	29.2	0.0147	0.024	Squash	0	5.4166667	3		92.40	127.63	92.40	31.6	34%
CV631	14.3	0.1612	0.024	Squash	0	5.4166667	3		305.73	127.63	127.63	31.6	25%
CV631	23.0	-0.1590	0.024	Squash	0	5.4166667	3		0.00	127.63	0.00	31.6	
CV632	291.5	0.0067	0.025	Trapezoid	0	6	1	3	199.28	270	199.28	31.6	16%
CV633	14.2	0.3287	0.024	Circle	3				207.15	70.69	70.69	32.0	45%
CV633	18.3	-0.1167	0.024	Circle	3				0.00	70.69	0.00	32.0	
CV633	29.6	0.0034	0.024	Circle	3				21.00	70.69	21.00	32.0	152%
CV637	35.4	0.0028	0.024	Circle	2.33				9.82	34.11	9.82	62.3	634%
CV637	328.8	0.0015	0.013	Circle	2.33				13.04	34.11	13.04	62.3	478%
CV637	6.9	0.0015	0.024	Circle	2.33				7.05	34.11	7.05	62.3	884%
CV639	142.3	0.0181	0.013	Circle	3				89.81	70.69	70.69	47.0	66%
CV639	124.3	0.0038	0.013	Circle	3				41.02	70.69	41.02	47.0	115%
CV639	125.7	0.0017	0.013	Squash	0	3	2.1666667		17.44	51.05	17.44	47.0	270%
CV639	352.5	0.0060	0.013	Circle	3				51.60	70.69	51.60	47.0	91%
CV639	20.4	-0.0005	0.013	Circle	3				0.00	70.69	0.00	47.0	
CV639	266.4	0.0053	0.013	Circle	3				48.35	70.69	48.35	47.0	97%
CV640	318.4	0.0047	0.013	Circle	3				45.63	70.69	45.63	51.0	112%
CV640	74.7	0.0017	0.013	Circle	3				27.82	70.69	27.82	51.0	183%
CV640	23.6	-0.0148	0.013	Circle	3				0.00	70.69	0.00	51.0	
CV640	297.8	0.0048	0.013	Circle	3				46.22	70.69	46.22	51.0	110%
CV642	84.2	0.0256	0.013	Circle	0				60.95	0	0.00	81.1	
CV642	54.6	0.0081	0.013	Circle	0				34.16	0	0.00	81.1	
CV642	156.1	-0.0038	0.013	Circle	2.67				0.00	55.99	0.00	81.1	
CV642	146.2	0.0066	0.024	Circle	2.5				18.00	49.09	18.00	81.1	450%
CV642	131.8	0.0205	0.024	Circle	2.5				31.80	49.09	31.80	81.1	255%
CV643	34.2	0.0032	0.013	Circle	3				37.81	70.69	37.81	118.6	314%
CV643	279.8	0.0045	0.013	Circle	3				44.58	70.69	44.58	118.6	266%
CV643	184.5	-0.0249	0.013	Circle	3				0.00	70.69	0.00	118.6	
CV643	34.0	0.0215	0.024	Circle	2.5				32.56	49.09	32.56	118.6	364%
CV644	291.4	0.0036	0.024	Circle	2				7.32	25.13	7.32	50.0	683%
CV644	107.9	0.0168	0.024	Circle	2				15.87	25.13	15.87	50.0	315%
CV644	15.9	0.1826	0.024	Circle	1.25				14.95	9.82	9.82	50.0	509%
CV644	298.4	0.0039	0.024	Circle	2				7.61	25.13	7.61	50.0	657%
CV644	58.4	0.0445	0.024	Circle	2				25.86	25.13	25.13	50.0	199%
CV645	309.9	-0.0021	0.024	Circle	2				0.00	25.13	0.00	55.7	
CV645	134.0	-0.0036	0.024	Circle	2				0.00	25.13	0.00	55.7	
CV645	295.5	-0.0003	0.024	Circle	2				0.00	25.13	0.00	55.7	
CV646	240.0	0.0008	0.024	Circle	2				3.36	25.13	3.36	27.1	807%
CV646	255.1	0.0032	0.024	Circle	2				6.95	25.13	6.95	27.1	390%

APPENDIX C

Detention Basin Data

Detention Basin Stage Storage Curves

Basin	USB621		USB51		USB622		USB17		DB1			
Description	Theoretical		Theoretical		Theoretical		Theoretical					
Notes	Apt complex theoretical		Parking Lot theoretical		Parking Lot theoretical		Parking Lot theoretical		Utahna South			
									Corrected from old curves			
	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs	Elevation ft	Storage ac-ft
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4315.68	0.00
	0.09	1.46	0.12	1.24	0.10	0.97	0.06	0.64	0.01	0.38	4316.00	0.11
	0.27	4.38	0.35	3.72	0.29	2.91	0.19	1.93	0.03	0.72	4317.00	1.30
	0.42	4.38	0.54	3.72	0.45	2.91	0.30	1.93	0.07	1.24	4318.00	3.73
	0.55	4.38	0.70	3.72	0.58	2.91	0.39	1.93	0.15	2.02	4319.00	6.98
	0.73	4.38	0.93	3.72	0.78	2.91	0.51	1.93	0.31	3.38	4320.00	10.37
	0.91	4.38	1.16	3.72	0.97	2.91	0.64	1.93	0.63	5.35	4321.00	13.88
	1.09	7.30	1.40	6.20	1.16	4.85	0.77	3.21	1.27	7.82		
									2.55	11.28		
									5.11	15.46		
									6.00	16.71		
									6.40	17.98		
									6.90	20.86		
									7.67	28.41		
									9.40	60.83		
									10.23	65.32		
									12.90	78.93		
									13.88	91.65		

Basin	DB2				USB31		USB29		USB632		USB28	
Description					Theoretical		Theoretical		Theoretical		Theoretical	
Notes	Utahna North				Volume is close		Parking Lot theoretical		Parking Lot theoretical		Parking Lot theoretical	
	Corrected from old curves											
	Storage ac-ft	Discharge cfs	Elevation ft	Storage ac-ft	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs
	0.00	0.00	4311.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	9.83	4311.00	0.00	0.10	1.39	0.02	0.61	0.12	1.01	0.04	0.91
	0.03	11.34	4312.00	0.01	0.30	4.18	0.05	1.82	0.36	3.02	0.13	2.72
	0.07	11.90	4313.00	0.18	0.46	4.18	0.08	1.82	0.55	3.02	0.20	2.72
	0.15	12.54	4314.00	0.85	0.61	4.18	0.10	1.82	0.72	3.02	0.26	2.72
	0.31	13.49	4315.00	2.14	0.81	4.18	0.13	1.82	0.96	3.02	0.34	2.72
	0.63	14.80	4316.00	3.87	1.01	4.18	0.17	1.82	1.20	3.02	0.43	2.72
	1.27	16.29	4317.00	5.81	1.21	6.97	0.20	3.03	1.43	5.03	0.52	4.53
	2.55	18.08	4318.00	7.89								
	5.11	20.05										
	7.67	21.28										
	7.89	21.53										

Detention Basin Stage Storage Curves

Basin	DB408		DB409		DB54		DB55		DB598		DB175	
Description												
Notes	Parking Lot? Can't see		Parking Lot? Can't see		Parking Lot? Can't see		Parking Lot? Can't see		Parking Lot		Parking Lot	
	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.15	1.30	0.15	1.30	0.15	1.07	0.04	0.38	0.15	2.58	0.15	1.68
	0.31	1.83	0.31	1.83	0.31	1.52	0.08	0.54	0.31	3.64	0.31	2.37
	0.46	2.25	0.46	2.25	0.46	1.86	0.12	0.66	0.46	4.46	0.46	2.90
	0.61	2.59	0.61	2.59	0.61	2.14	0.18	0.76	0.61	5.15	0.61	3.35
	0.77	2.90	0.77	2.90	0.77	2.40	0.24	0.85	0.77	5.76	0.77	3.75
	0.92	3.18	0.92	3.18	0.92	2.63	0.31	0.93	0.92	6.31	0.92	4.10
	1.08	3.43	1.08	3.43	1.08	2.84	0.39	1.00	1.08	6.81	1.08	4.43
	1.23	3.67	1.23	3.67	1.23	3.03	0.48	1.07	1.23	7.29	1.23	4.74
	1.39	3.89	1.39	3.89	1.39	3.22	0.58	1.14	1.39	7.73	1.39	5.03
	1.54	4.10	1.54	4.10	1.54	3.39	0.69	1.20	1.54	8.15	1.54	5.30
	1.70	4.30	1.70	4.30	1.70	3.56	0.81	1.26	1.70	8.54	1.70	5.56
	1.86	4.49	1.86	4.49	1.86	3.71	0.94	1.31	1.86	8.92	1.86	5.80

Detention Basin Stage Storage Curves

Basin	DB174		DB479		DB664		USB634		USB630		DB5East	
Description					Only catches part of		Theoretical		Theoretical			
Notes	Parking Lot		Parking Lot		24 hr fitness lot		Apartment Cmplx		Parking Lot			
					Parking Lot							
	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.04	1.19	0.15	0.91	0.06	1.19	0.05	1.08	0.14	1.53	4.00	0.00
	0.10	1.68	0.31	1.28	0.12	1.68	0.14	3.23	0.43	4.60	5.50	8.00
	0.16	2.06	0.46	1.57	0.19	2.06	0.22	3.23	0.66	4.60	7.10	11.00
	0.23	2.38	0.61	1.81	0.27	2.38	0.28	3.23	0.86	4.60	9.00	14.00
	0.30	2.66	0.77	2.03	0.36	2.66	0.38	3.23	1.15	4.60	11.00	16.00
	0.39	2.91	0.92	2.22	0.45	2.91	0.47	3.23	1.44	4.60	13.00	18.00
	0.48	3.14	1.08	2.40	0.56	3.14	0.57	5.39	1.72	7.67	15.00	20.00
	0.58	3.36	1.23	2.57	0.67	3.36					18.00	25.00
	0.69	3.57	1.39	2.72	0.79	3.57					20.00	40.00
	0.80	3.76	1.54	2.87	0.92	3.76						
	0.93	3.94	1.70	3.01	1.05	3.94						
	1.06	4.12	1.86	3.14	1.20	4.12						

Basin	DB572		DB5East		DB5Eastb		DB572		DB3			
Description	pond ups. Little											
Notes	green		Calculated from SSA		Calculated from SSA		Calculated from SSA					
	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs	Elevation ft	Storage ac-ft
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.78	30.82	0.60	0.70	0.10	0.10	0.10	0.20	0.10	7.00	0.61	0.02
	1.59	43.59	0.80	0.60	0.20	0.20	0.20	1.00	0.30	13.10	1.61	0.28
	2.72	53.38	1.50	2.20	0.30	0.40	0.30	2.05	0.55	15.70	2.61	1.34
	4.46	61.64	2.10	4.50	0.40	0.75	0.40	3.50	1.00	17.50	3.61	3.31
	7.32	68.92	2.30	7.70	1.50	7.20	0.60	6.90	1.50	18.60	4.61	5.65
	11.78	75.49	4.45	23.50	2.50	14.10	1.00	15.10	2.10	19.60	5.61	8.14
			6.30	30.00	3.33	20.30	1.30	22.00	2.50	19.70	6.61	10.76
			9.50	37.70	3.90	22.10	1.52	27.00	5.00	21.50	7.61	13.49
			11.30	42.40	4.20	22.70			10.00	24.50	8.61	16.35
			14.19	48.50	4.62	23.50			16.00	27.50	9.61	19.34
									22.47	30.10	10.61	22.47

Detention Basin Stage Storage Curves

Basin	DB5South		DB4				DB1103		DBT1103b		DBT1102c	
Description												
Notes	slightly off								out of study area		out of study area	
	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs	Elevation ft	Storage ac-ft	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs
	0.00	0.00	0.00	0.00	4310.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.04	1.37	0.10	10.70	4311.00	0.06	0.00	2.58	0.01	1.74	0.01	1.89
	0.08	1.94	0.30	15.50	4312.00	0.74	0.00	3.80	0.02	2.46	0.02	2.67
	0.13	2.38	0.50	19.00	4313.00	1.80	0.04	4.94	0.03	3.01	0.03	3.28
	0.17	2.75	0.68	21.10	4314.00	2.95	0.12	5.34	0.05	3.47	0.05	3.78
	0.22	3.07	0.75	21.30	4315.00	4.17	1.00	9.00	0.07	3.88	0.07	4.23
	0.26	3.36	0.90	22.00	4316.00	5.48			0.09	4.25	0.09	4.63
	0.31	3.63	1.00	22.40					0.12	4.59	0.12	5.00
	0.36	3.88	1.07	22.62					0.16	4.91	0.16	5.35
	0.41	4.12	2.00	23.60					0.20	5.21	0.20	5.67
	0.46	4.34	3.00	25.45					0.26	5.49	0.26	5.98
	0.51	4.56	4.00	27.05					0.31	5.76	0.31	6.27
	0.56	4.76	5.48	29.10					0.38	6.02	0.38	6.55

Basin	DBT1102e		DBT1102b		DBT1102f		DB624		DB578		DB261	
Description												
Notes	out of study area		out of study area		out of study area		Can't verify		Parking Lot			
	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.01	0.95	0.01	0.64	0.01	0.47	0.70	9.76	0.10	18.47	0.10	8.20
	0.02	1.34	0.02	0.91	0.02	0.67	1.40	13.81	0.19	26.11	0.19	11.60
	0.03	1.64	0.03	1.11	0.03	0.82	2.10	16.91	0.29	31.98	0.29	14.21
	0.05	1.90	0.05	1.29	0.05	0.95	2.81	19.53	0.39	36.93	0.39	16.41
	0.07	2.12	0.07	1.44	0.07	1.06	3.51	21.83	0.49	41.29	0.49	18.35
	0.09	2.32	0.09	1.58	0.09	1.16	4.22	23.92	0.59	45.23	0.59	20.10
	0.12	2.51	0.12	1.70	0.12	1.25	4.93	25.83	0.69	48.85	0.69	21.71
	0.16	2.68	0.16	1.82	0.16	1.34	5.65	27.62	0.79	52.23	0.79	23.21
	0.20	2.85	0.20	1.93	0.20	1.42	6.36	29.29	0.89	55.40	0.89	24.61
	0.26	3.00	0.26	2.03	0.26	1.49	7.08	30.88	0.99	58.39	1.00	25.95
	0.31	3.15	0.31	2.13	0.31	1.57	7.80	32.38	1.09	61.24	1.10	27.21
	0.38	3.29	0.38	2.23	0.38	1.64	8.52	33.82	1.19	63.97	1.21	28.42
									2.00	90.00		

Detention Basin Stage Storage Curves

Basin	DB539		DB195		DB531b		DB531a		DB420		DB1505	
Description												
Notes	Parking Lot		Can't verify		Parking and Private		Parking and Private		modified for volume		Keep same for additional det in area See below	
	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.06	1.19	0.00	6.18	0.02	0.15	0.15	0.87	0.09	2.95	0.07	7.63
	0.12	1.68	0.01	8.73	0.04	0.30	0.31	1.23	0.19	4.18	0.14	10.79
	0.19	2.06	0.02	10.70	0.05	0.45	0.46	1.50	0.29	5.12	0.22	13.21
	0.27	2.38	0.03	12.35	0.08	0.60	0.61	1.74	0.39	5.91	0.30	15.25
	0.36	2.66	0.05	13.81	0.12	0.75	0.77	1.94	0.51	6.61	0.38	17.05
	0.45	2.91	0.08	15.13	0.50	2.00	0.92	2.13	0.63	7.24	0.47	18.68
	0.56	3.14	0.11	16.34			1.08	2.30	0.75	7.82	0.56	20.18
	0.67	3.36	0.15	17.47			1.23	2.46	0.88	8.36	0.65	21.57
	0.79	3.57	0.19	18.53			1.39	2.61	1.02	8.86	0.75	22.88
	0.92	3.76	0.25	19.53			1.54	2.75	1.17	9.34	0.84	24.12
	1.05	3.94	0.31	20.48			1.70	2.88	1.31	9.80	0.95	25.30
	1.20	4.12	0.39	21.39			1.86	3.01	1.47	10.23	1.05	26.42
									1.70	12.00		
									2.00	15.00		
									2.75	50.00		

Basin	Shed DET		WestDET		USB413		USB615		DB583		DB1308	
Description	1 acft 8 cfs line		Cannot Confirm		Theoretical		Theoretical					
Notes	fabricated for modeling								Private		Modify	
	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs	Storage ac-ft	Discharge cfs
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.03	1.67	0.19	2.70	0.07	1.06	0.02	0.47	0.06	1.19	0.05	4.50
	0.16	2.89	0.59	4.60	0.20	3.18	0.07	1.42	0.12	1.68	0.10	7.70
	0.28	3.73	1.02	6.00	0.31	3.18	0.10	1.42	0.19	2.06	0.12	8.60
	0.31	4.09	1.80	15.00	0.40	3.18	0.13	1.42	0.27	2.38	0.19	9.60
	0.41	5.00			0.53	3.18	0.17	1.42	0.36	2.66	0.30	10.10
	0.51	6.02			0.66	3.18	0.22	1.42	0.45	2.91	0.50	10.95
	1.00	8.00			0.80	5.31	0.26	2.37	0.56	3.14	0.60	11.27
									0.67	3.36		
									0.79	3.57		
									0.92	3.76		
									1.05	3.94		
									1.20	4.12		

Basin	USB619	
Description		
Notes	Theoretical	
	Storage ac-ft	Discharge cfs
	0.00	0.00
	0.01	0.31
	0.03	0.94
	0.04	0.94
	0.05	0.94
	0.07	0.94
	0.08	0.94
	0.10	1.56

APPENDIX D

Project Attributes and Costs

MURRAY CITY 2018 STORM DRAIN MASTER PLAN COSTS

1/17/2019
23.36.800

Project ID#	Constr. ID #	Diameter	Surface Slope	Shape	Notes	Length	Design Flow	Location	HMI_ID	Priority	IN/OUT of Road	C & G Capacity	Mannings Capacity	Velocity Capacity	Capacity
		(ft)	(ft/ft)			(ft)	(cfs)			(A/B/C)		(cfs)	cfs	(ft/s)	(cfs)
P1	20	2	0.0028	Circular	Prelim. Design	1155.3	47.3	725 E from 6600 S to LC Creek	725E	A	IN	0	12.0	25.1	12.0
	20	3.5	0.005	Circular	Prelim. Design	2758.3	75.3	725 E from 6600 S to LC Creek	725E	A	IN	0	71.1	96.2	71.1
	20	2.5	0.013	Circular	Prelim. Design	708.4	75.3	725 E from 6600 S to LC Creek	725E	A	IN	0	46.8	49.1	46.8
P2	94	2.5	0.009	Circular	Upsize SD	108.6	33.9	950 W to Murray Parkway Avenue in Walden Meadows	NA	A	IN	0	38.9	49.1	38.9
	95	2.5	0.006	Circular	New SD	739.2	33.9	950 W to Murray Parkway Avenue in Walden Meadows	NA	A	IN	0	31.8	49.1	31.8
	96	2.5	0.005	Circular	New SD	269.6	33.9	950 W to Murray Parkway Avenue in Walden Meadows	NA	A	IN	0	29.0	49.1	29.0
	97	2.5	0.005	Circular	New SD	159.9	33.9	950 W to Murray Parkway Avenue in Walden Meadows	NA	A	IN	0	29.0	49.1	29.0
	98	3	0.005	Circular	New SD	53.3	40.6	From Walden Meadows Dr. and Murray Pkwy to Jordan River	NA	A	IN	0	47.2	70.7	47.2
	99	3	0.005	Circular	Upsize SD	93.8	40.6	From Walden Meadows Dr. and Murray Pkwy to Jordan River	NA	A	IN	0	47.2	70.7	47.2
	100	3	0.005	Circular	Upsize SD	123.7	40.6	From Walden Meadows Dr. and Murray Pkwy to Jordan River	NA	A	OUT	0	47.2	70.7	47.2
P3	101	2.5	0.003	Circular	Upsize SD	1127	14.9	Roughly 870 W to 980 W along 5400 S	CV577	A	OUT	0	22.5	49.1	22.5
	102	3	0.003	Circular	Upsize SD	483.4	37.7	From 980 W to about 1030 W along 5400 S	CN217	A	OUT	0	36.5	70.7	36.5
	103	2	0.003	Circular	Upsize SD	59.8	14.9	Crossing end of Clover Meadow Dr.	CV576	A	IN	0	12.4	25.1	12.4
	104	2	0.003	Circular	Upsize SD	126.5	14.9	Between Houses From Clover Meadow Dr. to about 870 W	CV576	A	OUT	0	12.4	25.1	12.4
P4	105	2	0.006613	Circular	Upsize SD	1436.5	10	Rodeo Lane to Rainsborough Road	CN1302b	A	IN	0	18.4	25.1	18.4
	106	2	0.005454	Circular	Upsize SD	733.4	17	Ransborough Road to 1300 East	CN1302b	A	IN	0	16.7	25.1	16.7
	107	2.5	0.016078	Circular	Upsize SD	1088.5	17	1300 East to about Lakeside Drive	CN118b	A	IN	0	52.0	49.1	49.1
	108	3	0.008201	Circular	Upsize SD	1400.7	50	Lakeside Drive to Little Cottonwood Creek	CN120c	A	IN	0	60.4	70.7	60.4
P5	117	1.5	0.005	Circular	Upsize SD	66.4	12.1	Crossing Sanford Dr.	CNP536	A	IN	0	7.4	14.1	7.4
	50	2	0.005	Circular	Upsize SD	479.7	12.1	Anderson Ave. from Green Street to Sanford Dr.	CNP536	A	IN	0	16.0	25.1	16.0
P6	92	1.5	0.08	Circular	DB Piping	95	14	Outlet from Jenson Detention	CNP420b	A	OUT	0	29.7	14.1	14.1
	92	1.5	0.5	Circular	DB Piping	67	3	Inlet to Detention	CNP420b	A	IN	0	74.3	14.1	14.1
	92	2	2	Circular	DB Piping	39	20	Inlet to Detention	CNP420b	A	IN	0	319.9	25.1	25.1
	92	2	0.9	Circular	DB Piping	77	20	Outlet from Detention	CNP420b	A	OUT	0	214.6	25.1	25.1
	92	1.5	0.7	Circular	DB Piping	75	23	Piping from Pump to Cleanout	CNP420b	A	OUT	0	87.9	14.1	14.1
	92	2.5	0.6	Circular	DB Piping	132	45	Piping from 500 West to Detention	CNP420b	A	Out	0	317.7	49.1	49.1
	90	0	0		New DB	731.5	0	Cherry and Jensen and West Detention	DBP420b	A	DB	0	0	0	0
P7	4	1.5	0.004	Circular	New SD	1031.6	4.5	6400 S from 1865 E to Shenandoah	CNP1701	B	IN	13.97	6.6	14.1	20.6
	3	1.5	0.0048	Circular	New SD	1432.2	19.1	6400 S from Shenandoah to Rodeo Ln	CNP1512	B	IN	17.46	7.3	14.1	24.7
	2	2	0.004	Circular	New SD	1632.7	20.7	6400 S from Rodeo Ln to JSLC Canal	CNP1602	B	IN	13.97	14.3	25.1	28.3
	1	2	0.004	Circular	New and Upsize SD	341.2	20.6	6400 S from JSLC Canal to 1300 E	CNP1403	B	IN	13.97	14.3	25.1	28.3
P8a	17	2.5	0.004	Circular	New SD	688.8	23.2	900 E from 5700 S to 5600 S	CNP260	B	IN	6.98	25.9	49.1	32.9
	16	3	0.006	Circular	New SD	1442.4	59.4	900 E from 5600 S to Woodoak	CNP671	B	IN	19.05	51.7	70.7	70.7
	15	3	0.0055	Circular	New SD	1043.5	62.7	Woodoak from 900 E to 800 E	CNP498	B	IN	19.05	49.5	70.7	68.5
P8b	18	2	0.0132	Circular	New SD	1564.7	25.8	5600 S from 1080 E to 900 E	CNP662	B	IN	28.13	26.0	25.1	53.3
	19	2	0.0054	Circular	New SD	849.8	15.9	1080 E from 5730 S to 5600 S	CNP661	B	IN	17.46	16.6	25.1	34.1

Project ID#	Constr. ID #	Diameter	Surface Slope	Shape	Notes	Length	Design Flow	Location	HMI_ID	Priority	IN/OUT of Road	C & G Capacity	Mannings Capacity	Velocity Capacity	Capacity
		(ft)	(ft/ft)			(ft)	(cfs)			(A/B/C)		(cfs)	cfs	(ft/s)	(cfs)
P9	26	1.5	0.004	Circular	New SD	388.6	1.7	Wood Circle	CNP85	B	IN	0	6.6	14.1	6.6
	25	1.5	0.004	Circular	New SD	381.7	1.7	Hansen Circle	CNP643	B	IN	0	6.6	14.1	6.6
	24	1.5	0.004	Circular	New SD	374.9	1.7	Butler Circle	CNP643b	B	IN	0	6.6	14.1	6.6
	22	2	0.0053	Circular	New SD	1309.4	15.8	5770 S from Wood to State	CNP628	B	IN	17.46	16.5	25.1	33.9
	23	1.5	0.004	Circular	New SD	694.4	4.1	Lindon N-S stretch	CNP644	B	IN	0	6.6	14.1	6.6
P10a	27	2	0.0086	Circular	Upsize SD	315.7	80	300 W from 5775 S to Jefferson Detention	CNP41	B	IN	0	21.0	25.1	21.0
	27	2	0.0052	Circular	Replace SD	488.2	80	Riley Lane to RR crossing	CNP41	B	OUT	0	16.3	25.1	16.3
	28	2	0.008	Circular	Upsize SD	553.3	53.1	300 W from 5620 S to 5775 S	CNP40b	B	IN	0	20.2	25.1	20.2
	93	0	0	DB		503.3	0	New Detention Basin at south end of Riley Lane		B		0	0.0	0.0	0.0
	29	2	0.008	Circular	New SD	167.6	31.8	5620 S RR crossing	CNP40	B	OUT	0	20.2	25.1	20.2
P10b	33	1.5	0.0042	Circular	Upsize SD	884.3	6.1	5750 S from Nena to Topowa	CNP660	B	IN	13.97	6.8	14.1	20.8
	32	1.5	0.0054	Circular	New SD	829.7	8.7	5750 S from Topowa to Utahna	CNP38	B	IN	17.46	7.7	14.1	25.2
P11	109	1.5	0.005	Circular	New SD	142.8	3.4	NW Corner of Spring Clover to about 5200 South	CN337	B	IN	0	7.4	14.1	7.4
	110	2	0.002	Trapezoid	New SD	362.2	3.4	Ditch from about 5200 South to end of Germain Ave.	CN336	B	OUT	0	5.3	25.1	5.3
	111	1.5	0.01119	Circular	New SD	268.1	3.4	Through Private Properties at about 5200 South	CN336	B	OUT	0	11.1	14.1	11.1
P12	112	2	0.005	Circular	New SD	57.4	9.9	Cross Vine Street at about 315 East	NA	B	IN	0	16.0	25.1	16.0
	113	2	0.005	Circular	New SD	255	9.9	Vine Street from 315 E to Commerce Dr.	NA	B	IN	0	16.0	25.1	16.0
	114	2.5	0.005	Circular	New SD	27	24.9	Intersection of Vine and Commerce	NA	B	IN	0	29.0	49.1	29.0
	115	3	0.027	Circular	New SD	1055.8	38.5	Commerce Dr. from Vine to Bonneyview Ave.	NA	B	IN	0	109.6	70.7	70.7
	116	3	0.01	Circular	New SD	94.7	49.2	Bonneyview Ave. to Little Cottonwood Creek	NA	B	IN	0	66.7	70.7	66.7
P13	47	1.5	0.004	Circular	New SD	667.3	3	Woodrow to Hillcrest	CNP515	B	IN	0	6.6	14.1	6.6
P14	83	3	0.005	Circular	Upsize SD	1562	67.3	Main from 4500 S to Gilbride	CNP539	B	IN	0	47.2	70.7	47.2
	82	3	0.022	Circular	Upsize SD	404	69.4	Main from Gilbride to BC Creek	CNP538	B	IN	0	98.9	70.7	70.7
P15	78	2	0.004	Circular	Upsize SD	527.8	11.2	Brown from McHenry to Murray St.	CNP379	B	IN	0	14.3	25.1	14.3
	81	1.5	0.004	Circular	New SD	340.8	2.8	McHenry	CNP281a	B	IN	0	6.6	14.1	6.6
	79	1.5	0.004	Circular	New SD	345.8	2.8	Murray St	CNP281c	B	IN	0	6.6	14.1	6.6
	80	1.5	0.004	Circular	New SD	305.5	2.8	4675 S Brown St Parking Lot	CNP281b	B	IN	0	6.6	14.1	6.6
P16	123	4	0.005	Circular	Replace Aging SD	3492	28.5	Winchester from just West of 700 West to Jordan River	CN551, CN548, CN306	B	IN	0	101.6	125.7	101.6
P17	5	1.5	0.0075	Circular	New SD	1535.6	6	Van Winkle from 5800 S to 5600 S	CNP1202b	C	OUT	0	9.1	14.1	9.1
P18	7	5	0.0077	Circular	New SD	1980.3	195.8	Van Winkle from 5315 S to 1300 E	CNP1101	C	OUT	0	228.5	196.3	196.3
	8	5	0.0074	Circular	New SD	937.9	182.4	Van Winkle from 5465 S to 5315 S	CNP1102a	C	OUT	0	224.0	196.3	196.3
	10	3	0.0067	Circular	New SD	708	55	Van Winkle from 5600 S to 5400 S	CNP1103a	C	OUT	0	54.6	70.7	54.6
	9	4	0.0074	Circular	New SD	541.3	115.6	Van Winkle from 5535 S to 5465 S	CNP1103	C	OUT	0	123.6	125.7	123.6
	11	5	0.005	Circular	New SD	4288.3	235.7	Van Winkle from 1300 E to Discharge	CNP1101b	C	OUT	0	184.2	196.3	184.2
P19	13	3.5	0.0088	Circular	Upsize SD	1426.9	68.5	Gold's Gym Parking Lot	CNP1103c	C	IN	23.35	94.4	96.2	117.7
	12	4	0.004	Circular	New SD	396.4	74.6	From Gold's Gym across Van Winkle	CNP1103b	C	IN	0	90.8	125.7	90.8
P20	14	4	0.0117	Circular	New SD	938.3	105.1	El Sendero	CNP122	C	IN	0	155.4	125.7	125.7
P21	63	1.5	0.005	Circular	New SD	811.2	3	Hanauer 4800 S to Vine	CNP570	C	IN	17.46	7.4	14.1	24.9
	64	1.5	0.004	Circular	New SD	577.9	4	Box Elder from 4800 to 4900 S	CNP577	C	IN	13.97	6.6	14.1	20.6
	63	1.5	0.0492	Circular	New SD	212.4	4	Box Elder 4900 S to 4930 S	CNP568b	C	IN	17.46	23.3	14.1	31.6

Project ID#	Constr. ID #	Diameter	Surface Slope	Shape	Notes	Length	Design Flow	Location	HMI_ID	Priority	IN/OUT of Road	C & G Capacity	Mannings Capacity	Velocity Capacity	Capacity
		(ft)	(ft/ft)			(ft)	(cfs)			(A/B/C)		(cfs)	cfs	(ft/s)	(cfs)
P22	89	2	0.004	Circular	New SD	2155.5	9.5	200 West from 4800 S to 4550 S	CNP163	C	IN	0	14.3	25.1	14.3
	88	2	0.004	Circular	Upsize SD	695.5	9.2	4500 Frontage from 200 W to 260 W	CNP163b	C	IN	0	14.3	25.1	14.3
P23	84	3	0.004	Circular	New SD	283.1	35.8	4500 Frontage from Box Elder to Auto	CNP163a	C	IN	0	42.2	70.7	42.2
	85	1.5	0.0054	Circular	New SD	1601.5	4	Box Elder from Miller to 4500 S	CNP543	C	IN	0	7.7	14.1	7.7
	86	3	0.004	Circular	New SD	1405.5	30.6	4500 Frontage from 160 W to Box Elder	CNP282	C	IN	0	42.2	70.7	42.2
P24	87	2.5	0.0068	Circular	Upsize SD	975.5	43.8	Auto Blvd from 4500 S to 4600 S	CNP382	C	IN	0	33.8	49.1	33.8
P25	67	1.5	0.005	Circular	New SD	32.6	8	Center from Elm to Division	CNP656b	C	IN	0	7.4	14.1	7.4
	68	2	0.004	Circular	New SD	322.6	15	Center from Division to 4800 S	CNP655	C	IN	0	14.3	25.1	14.3
	66	2	0.0103	Circular	New SD	1714.6	30	4800 S from Center to Little Green	CNP573b	C	IN	0	23.0	25.1	23.0
P26	72	1.5	0.0096	Circular	New SD	959.1	1	Glen from 5000 S to Clark	CNP381	C	IN	0	10.3	14.1	10.3
	71	3	0.003	Trapezoid	New SD	518.1	3.3	From Glen and Clark intersect to L. Green	CNP141	C	OUT	0	13.6	70.7	13.6
P27	77	1.5	0.0148	Circular	New SD	817.9	10.8	Meadowview Rd to Meadow Way	CNP280	C	IN	0	12.8	14.1	12.8
	76	2	0.0096	Circular	New and Upsize SD	697	13.2	Meadow to Creek	CNP142	C	IN	0	22.2	25.1	22.2
P28	118	2.5	0.0028	Circular	Replace Aging SD	35.4	62.5	6100 South across East Entrance to Mall	CVP637	C	IN	0	21.7	49.1	21.7
	119	2.5	0.0015	Circular	Replace Aging SD	6.9	62.5	6100 South Across East Entrance to Mall	CVP637	C	IN	0	15.9	49.1	15.9
	120	4.5	0.004	circular	Replace Aging SD	3663	254	6100 South from East Entrance to Mall to about 340 West	CN447, CN468, CN469, CN470, CN471, CN475, CN476	C	IN	0	124.4	159.0	124.4
	121	4.5	0.004	circular	Replac Aging SD	75	254	Crossing UTA Trax just East of 300 West	CN475	C	IN	0	124.4	159.0	124.4
	122	5	0.0033	Circular	Replace Aging SD	2254	263	6100 South from 340 West to about 370 Wets then North to Detention Basin	CN476, CN477, CN478	C	IN	0	149.6	196.3	149.6

MURRAY CITY 2018 STORM DRAIN MASTER PLAN COSTS

1/17/2019
23.36.800

Project ID#	Constr. ID #	Shape	Notes	Length	Location	Descrip	Priority	Capacity	Cost/LF	Pipe Const. Cost	Other Costs (Description)	Total Const. Cost	Engineering & Contingency	Total Cost	Total Project Cost
				(ft)			(A/B/C)	(cfs)	$	$	$	$	$	$	$
	20	Circular	Prelim. Design	1155.3	725 E from 6600 S to LC Creek		A	12.0	$240	$277,726		$277,726	$83,318	**$361,043**	
P1	20	Circular	Prelim. Design	2758.3	725 E from 6600 S to LC Creek		A	71.1	$444	$1,225,312		$1,225,312	$367,594	**$1,592,906**	**$2,227,000**
	20	Circular	Prelim. Design	708.4	725 E from 6600 S to LC Creek		A	46.8	$296	$209,562		$209,562	$62,869	**$272,430**	
	94	Circular	Upsize SD	108.6	950 W to Murray Parkway Avenue in Walden Meadows		A	38.9	$296	$32,143		$32,143	$9,643	**$41,786**	
	95	Circular	New SD	739.2	950 W to Murray Parkway Avenue in Walden Meadows		A	31.8	$286	$211,419		$211,419	$63,426	**$274,845**	
P2	96	Circular	New SD	269.6	950 W to Murray Parkway Avenue in Walden Meadows		A	29.0	$288	$77,639		$77,639	$23,292	**$100,931**	
	97	Circular	New SD	159.9	950 W to Murray Parkway Avenue in Walden Meadows		A	29.0	$289	$46,146		$46,146	$13,844	**$59,989**	**$628,000**
	98	Circular	New SD	53.3	From Walden Meadows Dr. and Murray Pkwy to Jordan River		A	47.2	$470	$25,039		$25,039	$7,512	**$32,551**	
	99	Circular	Upsize SD	93.8	From Walden Meadows Dr. and Murray Pkwy to Jordan River		A	47.2	$441	$41,341		$41,341	$12,402	**$53,743**	
	100	Circular	Upsize SD	123.7	From Walden Meadows Dr. and Murray Pkwy to Jordan River		A	47.2	$397	$49,127		$49,127	$14,738	**$63,865**	
	101	Circular	Upsize SD	1127	Roughly 870 W to 980 W along 5400 S		A	22.5	$242	$272,367		$272,367	$81,710	**$354,077**	
P3	102	Circular	Upsize SD	483.4	From 980 W to about 1030 W along 5400 S		A	36.5	$326	$157,550		$157,550	$47,265	**$204,816**	**$722,000**
	103	Circular	Upsize SD	59.8	Crossing end of Clover Meadow Dr.		A	12.4	$243	$14,507		$14,507	$4,352	**$18,859**	
	104	Circular	Upsize SD	126.5	Between Houses From Clover Meadow Dr. to about 870 W	Trenchless	A	12.4	$189	$23,945	$86,471	$110,416	$33,125	**$143,541**	
	105	Circular	Upsize SD	1436.5	Rodeo Lane to Rainsborough Road		A	18.4	$245	$351,463		$351,463	$105,439	**$456,902**	
P4	106	Circular	Upsize SD	733.4	Ransborough Road to 1300 East		A	16.7	$245	$179,447		$179,447	$53,834	**$233,281**	**$1,848,000**
	107	Circular	Upsize SD	1088.5	1300 East to about Lakeside Drive		A	49.1	$301	$327,576		$327,576	$98,273	**$425,849**	
	108	Circular	Upsize SD	1400.7	Lakeside Drive to Little Cottonwood Creek		A	60.4	$402	$562,694		$562,694	$168,808	**$731,503**	
P5	117	Circular	Upsize SD	66.4	Crossing Sanford Dr.		A	7.4	$240	$15,955		$15,955	$4,786	**$20,741**	**$177,000**
	50	Circular	Upsize SD	479.7	Anderson Ave. from Green Street to Sanford Dr.		A	16.0	$249	$119,539		$119,539	$35,862	**$155,401**	
	92	Circular	DB Piping	95	Outlet from Jenson Detention	Includes 1 Combination Inlet	A	14.1	$203	$19,315		$19,315	$5,795	$25,110	
	92	Circular	DB Piping	67	Inlet to Detention	Includes 1 Inlet and One Combination	A	14.1	$292	$19,562		$19,562	$5,869	$25,431	
	92	Circular	DB Piping	39	Inlet to Detention	Includes 1 Combination	A	25.1	$371	$14,450		$14,450	$4,335	$18,785	
P6	92	Circular	DB Piping	77	Outlet from Detention	Includes 1 Combination	A	25.1	$255	$19,632		$19,632	$5,890	$25,521	**$252,000**
	92	Circular	DB Piping	75	Piping from Pump to Cleanout	Includes 1 Cleanout Box	A	14.1	$173	$13,012		$13,012	$3,904	$16,916	
	92	Circular	DB Piping	132	Piping from 500 West to Detention	Includes 1 Junction Box	A	49.1	$278	$36,730		$36,730	$11,019	$47,749	
	90		New DB	731.5	Cherry and Jensen and West Detention	Other costs are demo, excavation	A	0	0	$0	$70,937	$70,937	$21,281	$92,219	
	4	Circular	New SD	1031.6	6400 S from 1865 E to Shenandoah		B	20.6	$207	$213,849		$213,849	$64,155	**$278,004**	
P7	3	Circular	New SD	1432.2	6400 S from Shenandoah to Rodeo Ln		B	24.7	$207	$296,872		$296,872	$89,062	**$385,934**	**$1,292,000**
	2	Circular	New SD	1632.7	6400 S from Rodeo Ln to JSLC Canal		B	28.3	$245	$399,478		$399,478	$119,843	**$519,322**	
	1	Circular	New and Upsize SD	341.2	6400 S from JSLC Canal to 1300 E		B	28.3	$245	$83,490		$83,490	$25,047	**$108,537**	
	17	Circular	New SD	688.8	900 E from 5700 S to 5600 S		B	32.9	$301	$207,291		$207,291	$62,187	**$269,479**	
P8a	16	Circular	New SD	1442.4	900 E from 5600 S to Woodoak		B	70.7	$400	$577,109		$577,109	$173,133	**$750,242**	**$1,563,000**
	15	Circular	New SD	1043.5	Woodoak from 900 E to 800 E		B	68.5	$400	$417,536		$417,536	$125,261	**$542,797**	
P8b	18	Circular	New SD	1564.7	5600 S from 1080 E to 900 E		B	53.3	$245	$382,840		$382,840	$114,852	**$497,692**	**$769,000**
	19	Circular	New SD	849.8	1080 E from 5730 S to 5600 S		B	34.1	$245	$207,931		$207,931	$62,379	**$270,311**	
	26	Circular	New SD	388.6	Wood Circle		B	6.6	$200	$77,771		$77,771	$23,331	**$101,103**	
	25	Circular	New SD	381.7	Hansen Circle		B	6.6	$201	$76,534		$76,534	$22,960	**$99,494**	
P9	24	Circular	New SD	374.9	Butler Circle		B	6.6	$201	$75,315		$75,315	$22,595	**$97,910**	**$875,000**
	22	Circular	New SD	1309.4	5770 S from Wood to State		B	33.9	$233	$304,915		$304,915	$91,475	**$396,390**	
	23	Circular	New SD	694.4	Lindon N-S stretch		B	6.6	$199	$138,197		$138,197	$41,459	**$179,657**	
	27	Circular	Upsize SD	315.7	300 W from 5775 S to Jefferson Detention		B	21.0	$242	$76,505		$76,505	$22,951	**$99,456**	
	27	Circular	Replace SD	488.2	Riley Lane to RR crossing		B	16.3	$192	$93,929		$93,929	$28,179	**$122,107**	
P10a	28	Circular	Upsize SD	553.3	300 W from 5620 S to 5775 S		B	20.2	$231	$127,987		$127,987	$38,396	**$166,383**	**$661,000**
	93	DB		503.3	New Detention Basin at south end of Riley Lane	Detention Basin	B	0.0	$0	$0	$58,003	$58,003	$17,401	**$75,403**	
	29	Circular	New SD	167.6	5620 S RR crossing	Other costs include boring	B	20.2	$192	$32,171	$119,390	$151,562	$45,468	**$197,030**	
P10b	33	Circular	Upsize SD	884.3	5750 S from Nena to Topowa		B	20.8	$198	$174,744		$174,744	$52,423	**$227,168**	**$442,000**
	32	Circular	New SD	829.7	5750 S from Topowa to Utahna		B	25.2	$199	$164,955		$164,955	$49,487	**$214,442**	
	109	Circular	New SD	142.8	NW Corner of Spring Clover to about 5200 South		B	7.4	$201	$28,702		$28,702	$8,611	**$37,313**	
P11	110	Trapezoid	New SD	362.2	Ditch from about 5200 South to end of Germain Ave.		B	5.3	$198	$71,622		$71,622	$21,487	**$93,109**	**$339,000**
	111	Circular	New SD	268.1	Through Private Properties at about 5200 South	Trenchless	B	11.1	$149	$40,077	$120,180	$160,257	$48,077	**$208,334**	

Project ID#	Constr. ID #	Shape	Notes	Length	Location	Descrip	Priority	Capacity	Cost/LF	Pipe Const. Cost	Other Costs (Description)	Total Const. Cost	Engineering & Contingency	Total Cost	Total Project Cost
				(ft)			(A/B/C)	(cfs)	$	$	$	$	$	$	$
	112	Circular	New SD	57.4	Cross Vine Street at about 315 East		B	16.0	$287	$16,487		$16,487	$4,946	**$21,433**	
	113	Circular	New SD	255	Vine Street from 315 E to Commerce Dr.		B	16.0	$233	$59,302		$59,302	$17,791	**$77,093**	
P12	114	Circular	New SD	27	Intersection of Vine and Commerce		B	29.0	$366	$9,870		$9,870	$2,961	**$12,831**	**$718,000**
	115	Circular	New SD	1055.8	Commerce Dr. from Vine to Bonneyview Ave.		B	70.7	$400	$422,447		$422,447	$126,734	**$549,181**	
	116	Circular	New SD	94.7	Bonneyview Ave. to Little Cottonwood Creek		B	66.7	$467	$44,193		$44,193	$13,258	**$57,451**	
P13	47	Circular	New SD	667.3	Woodrow to Hillcrest		B	6.6	$200	$133,339		$133,339	$40,002	**$173,340**	**$174,000**
P14	83	Circular	Upsize SD	1562	Main from 4500 S to Gilbride		B	47.2	$400	$624,977		$624,977	$187,493	**$812,471**	**$1,023,000**
	82	Circular	Upsize SD	404	Main from Gilbride to BC Creek		B	70.7	$400	$161,646		$161,646	$48,494	**$210,140**	
	78	Circular	Upsize SD	527.8	Brown from McHenry to Murray St.		B	14.3	$249	$131,512		$131,512	$39,453	**$170,965**	
P15	81	Circular	New SD	340.8	McHenry		B	6.6	$210	$71,701		$71,701	$21,510	**$93,212**	**$446,000**
	79	Circular	New SD	345.8	Murray St		B	6.6	$210	$72,598		$72,598	$21,779	**$94,377**	
	80	Circular	New SD	305.5	4675 S Brown St Parking Lot		B	6.6	$219	$66,922		$66,922	$20,077	**$86,999**	
P16	123	Circular	Replace Aging SD	3492	Winchester from just West of 700 West to Jordan River		B	101.6	$455	$1,590,604		$1,590,604	$477,181	**$2,067,785**	**$2,068,000**
P17	5	Circular	New SD	1535.6	Van Winkle from 5800 S to 5600 S		C	9.1	$160	$246,335		$246,335	$73,900	**$320,235**	**$321,000**
	7	Circular	New SD	1980.3	Van Winkle from 5315 S to 1300 E		C	196.3	$576	$1,140,459		$1,140,459	$342,138	**$1,482,596**	
	8	Circular	New SD	937.9	Van Winkle from 5465 S to 5315 S		C	196.3	$576	$540,149		$540,149	$162,045	**$702,194**	
P18	10	Circular	New SD	708	Van Winkle from 5600 S to 5400 S		C	54.6	$322	$227,738		$227,738	$68,321	**$296,060**	**$5,981,000**
	9	Circular	New SD	541.3	Van Winkle from 5535 S to 5465 S		C	123.6	$411	$222,366		$222,366	$66,710	**$289,076**	
	11	Circular	New SD	4288.3	Van Winkle from 1300 E to Discharge		C	184.2	$576	$2,469,656		$2,469,656	$740,897	**$3,210,553**	
P19	13	Circular	Upsize SD	1426.9	Gold's Gym Parking Lot		C	117.7	$454	$648,281		$648,281	$194,484	**$842,765**	**$1,096,000**
	12	Circular	New SD	396.4	From Gold's Gym across Van Winkle		C	90.8	$490	$194,247		$194,247	$58,274	**$252,521**	
P20	14	Circular	New SD	938.3	El Sendero		C	125.7	$486	$456,341		$456,341	$136,902	**$593,243**	**$594,000**
	63	Circular	New SD	811.2	Hanauer 4800 S to Vine		C	24.9	$207	$168,159		$168,159	$50,448	**$218,606**	
P21	64	Circular	New SD	577.9	Box Elder from 4800 to 4900 S		C	20.6	$207	$119,794		$119,794	$35,938	**$155,733**	**$432,000**
	63	Circular	New SD	212.4	Box Elder 4900 S to 4930 S		C	31.6	$207	$44,017		$44,017	$13,205	**$57,222**	
P22	89	Circular	New SD	2155.5	200 West from 4800 S to 4550 S	Other costs are curb and gutter on both sides	C	14.3	$245	$527,413	$32,677	$560,090	$168,027	**$728,117**	**$964,000**
	88	Circular	Upsize SD	695.5	4500 Frontage from 200 W to 260 W	Other costs are curb and gutter on both sides	C	14.3	$245	$170,171	$10,544	$180,714	$54,214	**$234,929**	
	84	Circular	New SD	283.1	4500 Frontage from Box Elder to Auto		C	42.2	$393	$111,266		$111,266	$33,380	**$144,646**	
P23	85	Circular	New SD	1601.5	Box Elder from Miller to 4500 S		C	7.7	$207	$331,985		$331,985	$99,596	**$431,581**	**$1,434,000**
	86	Circular	New SD	1405.5	4500 Frontage from 160 W to Box Elder	Other costs include boring	C	42.2	$400	$562,362	$96,843	$659,205	$197,761	**$856,966**	
P24	87	Circular	Upsize SD	975.5	Auto Blvd from 4500 S to 4600 S		C	33.8	$301	$293,581		$293,581	$88,074	**$381,655**	**$382,000**
	67	Circular	New SD	32.6	Center from Elm to Division		C	7.4	$369	$12,045		$12,045	$3,613	**$15,658**	
P25	68	Circular	New SD	322.6	Center from Division to 4800 S		C	14.3	$242	$78,000		$78,000	$23,400	**$101,400**	**$663,000**
	66	Circular	New SD	1714.6	4800 S from Center to Little Green		C	23.0	$245	$419,520		$419,520	$125,856	**$545,376**	
	72	Circular	New SD	959.1	Glen from 5000 S to Clark		C	10.3	$203	$194,243		$194,243	$58,273	**$252,516**	
P26	71	Trapezoid	New SD	518.1	From Glen and Clark intersect to L. Green	Cost based on 150 BCY excavated @ $8.64/BCY updated - Jan 2011 to Sep 2018	C	13.6	$16	$8,150	$1,620	$9,770	$2,931	**$12,701**	**$266,000**
	77	Circular	New SD	817.9	Meadowview Rd to Meadow Way		C	12.8	$195	$159,319		$159,319	$47,796	**$207,114**	
P27	76	Circular	New and Upsize SD	697	Meadow to Creek		C	22.2	$232	$161,827		$161,827	$48,548	**$210,375**	**$418,000**
	118	Circular	Replace Aging SD	35.4	6100 South across East Entrance to Mall		C	21.7	$387	$13,713		$13,713	$4,114	**$17,826**	
	119	Circular	Replace Aging SD	6.9	6100 South Across East Entrance to Mall		C	15.9	$1,088	$7,508		$7,508	$2,253	**$9,761**	
P28	120	circular	Replace Aging SD	3663	6100 South from East Entrance to Mall to about 340 West		C	124.4	$706	$2,586,165		$2,586,165	$775,850	**$3,362,015**	**$5,853,000**
	121	circular	Replac Aging SD	75	Crossing UTA Trax just East of 300 West	Trenchless	C	124.4	$0	$0	$106,313	$106,313	$31,894	**$138,207**	
	122	Circular	Replace Aging SD	2254	6100 South from 340 West to about 370 Wets then North to Detention Basin		C	149.6	$767	$1,728,280	$60,000	$1,788,280	$536,484	**$2,324,764**	

2018 AVERAGE STORM DRAIN SYSTEM COST PER FOOT

Diameter (in)	Diameter (ft)	Outside Diameter (ft)	Material	Pipe Material & Installation (1)	Excavation	Imported Bedding Installed	Hauling Excess Native Mat'l	Trench Backfill Installed (3)	Trench Box per Day (2)	Average Daily Output	Trench Box Cost	Top Trench Width (ft)	Road Repair Width (ft)	Asphalt Cost	Manhole Cost	Inlet Cost	Curb & Gutter Cost	Utility Relocation	Trench Dewatering (4)	Total Cost per Foot of Pipe	Cost Out of Street (3)	Cost Out of Street w/ NO inlets	**October Update** Total Cost per Foot of Pipe	**October Update** Cost Out of Street (3)
15	1.3	1.46	RCP	$41.50	5.08	25.21	7.99	9.16	210.00	150	1.40	4.86	8.86	33.92	0.03	0	15.16	0	18.05	157.49	119.90	120	$162.85	$123.98
18	1.5	1.75	RCP	$49.00	5.72	28.52	9.00	9.75	210.00	132	1.59	5.15	9.15	34.86	0.03	0	15.16	0	19.78	173.39	135.55	136	$179.29	$140.16
21	1.8	2.04	RCP	$56.00	6.40	31.91	10.07	10.33	210.00	120	1.75	5.44	9.44	35.79	0.03	0	15.16	0	21.33	188.76	150.67	151	$195.18	$155.80
24	2.0	2.33	RCP	$67.00	7.12	35.38	11.19	10.92	210.00	100	2.10	5.73	9.73	36.73	0.03	0	15.16	0	23.92	209.55	171.21	171	$216.68	$177.04
27	2.3	2.63	RCP	$95.50	7.87	38.93	12.38	11.51	210.00	92	2.28	6.03	10.03	37.67	0.03	0	15.16	0	25.60	246.93	208.35	208	$255.33	$215.43
30	2.5	2.92	RCP	$104.00	8.67	42.56	13.63	12.10	210.00	88	2.39	6.32	10.32	38.61	0.03	0	15.16	0	26.85	263.98	225.15	225	$272.96	$232.80
33	2.8	3.21	RCP	$120.00	9.50	46.27	14.94	12.68	210.00	80	2.63	6.61	10.61	39.54	0.03	0	15.16	0	28.84	289.58	250.50	250	$299.43	$259.02
36	3.0	3.50	RCP	$136.00	10.37	50.06	16.30	13.27	210.00	72	2.92	6.90	10.90	40.48	0.04	0	15.16	37	31.12	352.26	276.39	276	$364.24	$285.79
42	3.5	4.08	RCP	$168.00	12.23	57.89	19.22	14.45	210.00	72	2.92	7.48	11.48	42.36	0.04	0	15.16	37	32.47	401.26	324.90	325	$414.91	$335.94
48	4.0	4.67	RCP	$177.00	14.24	66.03	22.38	15.62	210.00	64	3.28	8.07	12.07	44.23	0.06	0	15.16	37	35.83	430.36	353.50	354	$445.00	$365.52
54	4.5	5.25	RCP	$235.00	16.40	74.49	25.78	16.79	210.00	56	3.75	8.65	12.65	46.11	0.06	0	15.16	110	39.76	582.91	432.48	432	$602.73	$447.18
60	5.0	5.83	RCP	$293.00	18.72	83.27	29.43	17.97	210.00	48	4.38	9.23	13.23	47.98	0.09	0	15.16	110	44.55	664.14	513.21	513	$686.73	$530.66

Reference: 2018 RSMeans Heavy Construction Cost Data
Updated: 9/2018 JGH

Assumptions:

			Costs:	
Y	**Total Import Trench Backfill? (Y/N)**	9.70	$ 59.08	/CY Import Trench Backfill - use Imported Select Fill
Y	**Dewatering? (Y/N)**	0.95	$ 59.08	/CY Imported Select Fill - sec 31 23 23.16 (0200, 0500) 31 23 23.20 (4022): Sand, dead or bank w/ hauling (20 CY, 6 mi) and compaction. ($33/LCY + $5.80/LCY)*1.39 LCY/ECY + $5.15/ECY
Y	**Catch Basins & Inlets? (Y/N)**	0.99	$ 6.10	/CY Excavation - 31 23 16.13 1375: 10-14 ft deep, 1 CY excavator, Trench Box.
	One side of street C&G is regraded (30' street).	0.95	$ 28.93	/SY 4" Asphalt Pavement -32 11 23.23 (0390), 32 12 16.13 (0120, 0380), 31 23 23.20 (4022): 9" Bank run gravel base course ($6.95/SY), 2" Binder ($9.15/SY), 2" Wear ($10.25/SY [4"=$19.50/SY]) and Hauling ($5.15/ECY * 1.39LCY/ECY * 0.361CY/SY)
10	v:1h trench side slope (use trench boxes)	1.03	$ 2.72	/LF 4" Asphalt cutting - 02 41 19.25 (0015, 0020): Saw cutting asphalt up to 3" deep ($1.75/LF), each additional inch of depth ($0.97/LF)
3	' average depth to top of pipe	0.80	$ 2,500.00	/EA 4' Manhole (for pipes =< 2.5' diameter) - 33 05 61.10 (1130, 1140): Precast 8' deep ($2,500/ea), each add'l foot of depth ($288/VLF)
0.33	' thick asphalt road covering	0.96	$ 4,075.00	/EA 5' Manhole (for pipes > 2.5' and <= 3.5') -33 05 61.10 (1170, 1180): Precast 8' deep ($4,075/ea), each add'l foot of depth ($470/VLF)
0.75	' thick untreated base course	1.05	$ 5,950.00	/EA 6' Manhole (for pipes > 3.5' and <= 4.5') - 33 05 61.10 (1210, 1220): Precast 8' deep ($5,950/ea), each add'l foot of depth ($660/VLF)
100000	' Average distance between manholes	1.07	$ 8,833	/EA Manholes (for pipes > 4.5') ENR cost index adjustment from 2014 to January 2018
3	+ Outside Diameter = Bottom trench width	1.13	$ 1,550.00	/EA Catch basins -33 42 33.13 1582: Curb inlet frame, grate, and curb box, Large 24" x 36" heavy duty $1,550
1	' bedding over pipe	1.03	$ 15.16	/LF Curb & Gutter - 32 16 13.13 (0440, 0441) 32 11 23.23 (0390) : Steel forms, 24" wide, straight ($13.00/LF) and radius ($15.05/LF). Plus 9" bank run gravel ($6.95/sy or $1.54/lf) Calculated based on percentage of C&
0.5	' bedding under pipe	0.93	$ 9.59	/CY Hauling - 31 23 23.20 4622: 20 CY dump truck and conversion from loose to compacted volume. $6.90/LCY * 1.39 LCY/ECY
1	Inlets per 100 ft of pipe	1.00	$ 210.00	/day Trench Box (7' deep, 16' x 8',31 52 16.10 4500)
30%	of curb & gutter is on radius	0.94	$ 62.80	/CY Stabilization Gravel - sec 31 23 23.16 (0050, 0500) 31 23 23.20 (4022): Bank Run Gravel ($36/LCY * 1.39 LCY/ECY) plus compaction ($5.80/ECY) and hauling ($5.15/LCY * 1.39 LCY/ECY)
		1.03	$ 1,152.00	/day Dewatering - 31 23 19.20 (1000, 1020): 4" diaphragm pump, 8 hrs attended ($1025/day). Second pump ($127/day)

$ 1.83	Construction Cost Index ratio since 1998. See ENR Construction Cost Index.xlsx at H:\Standards\Calculations\Cost Estimating
5920	ENR Construction Cost Index 1998
10816	ENR Construction Cost Index January 2018
89.7%	RSMeans City Cost Index for Salt Lake City. NOT USED here.
11,183	ENR Construction Cost Index September 2018
1.034	October 2018 Factor

NOTES:

(1) Assumes Class 3 RCP (33 42 11.60). 33", 54", 66", & 78" costs were estimated by linear interpolation between sizes. Costs for these sizes may be higher because they are odd sizes.
(2) 7' deep trench box (16' x 8') 31 52 16.10 4500
(3) Backfill Material & Installation assumes in street. For out of street unit costs, the backfill material cost has been added in place of base course and asphalt.
(4) Dewatering assumes 1' stabilization gravel at the bottom of the trench plus dewatering pumps
(5) Conversion from loose to compacted volumes assumes 125 PCF for compacted density and 90 PCF for loose density. Or (125 PCF/ECY)/(90 PCF/LCY) = 1.39 LCY/ECY
(6) Conversion from cubic yards to square yards for hauling of asphalt paving assumed a total thickness of 13". 3 ft x 3 ft x (13 in)/(12 in/ft) = 0.361 CY/SY

Abbreviations:

VLF	vertical lineal foot
PCF	pounds per cubic foot
LCY	loose cubic yard
ECY	embankment cubic yard

Murray City Storm Drainage Master Plan
Miscellaneous Project Costs
026.36.800
10/12/2018

Detention Basins			P10a check			P10b			P17		
Action	Reference	Cost	Qty	Unit	Cost	Qty	Unit	Cost	Qty	Unit	Cost
Excavate, haul, grade		$17.85 /CY	6200	CY	$110,670.00	1129	CY	$20,158.60	1790	CY	$31,951.50
Erosion Control Mat		$7.35 /SY	1940	SY	$14,259.00	150	SY	$1,102.50	175	SY	$1,286.25
Erosion Mat and Rip Rap		$108.15 /SY	91	SY	$9,841.65	0	SY	$0.00	0	SY	$0.00
Inlet Outlet Structure		$16,222.50 ea	2	Struct.	$32,445.00	2	Struct.	$32,445.00	2	Struct.	$32,445.00
Mob Demob		8.0% ea	Mob/Demob		$13,377.25	Mob/Demob		$4,296.49	Mob/Demob		$5,254.62
				Total	**$180,592.90**		**Total**	**$58,002.59**		**Total**	**$70,937.37**

Boring			
Pipe Diameter		$/LF	$/Dia/LF
	20	$600	$30
	42	$450	$11
		Avg.	$20.36
Railroad Jack and Bore 33 05 07.23 (0600)			
Diameter		$/LF	$/Dia/LF
	36	$640	$18
	48	$800	$17
		Avg.	$17.22
		Combined Average	**$18.79**
Prepare Jacking Pits (33 05 07.23)		Min	$3,700
		Max	$25,500
		Avg.	**$14,600**

P10a check			P10b			P12a		
Dia.	48		Dia.	24		Dia.	24	
Length	581	$524,007	Length	200	$90,190	Length	127	$57,271
Pits	2	$29,200	Pits	2	$29,200	Pits	2	$29,200
Total		**$553,207**	**Total**		**$119,390**	**Total**		**$86,471**

P12b			P14			P21		
Dia.	24		Dia.	18		Dia.	36	
Length	127	$57,271	Length	269	$90,980	Length	100	$67,643
Pits	2	$29,200	Pits	2	$29,200	Pits	2	$29,200
Total		**$86,471**	**Total**		**$120,180**	**Total**		**$96,843**

P27		
Dia.	54	
Length	76	$77,113
Pits	2	$29,200
Total		**$106,313**

APPENDIX E

Model Results

Murray City Storm Drain Master Plan
HEC-HMS Model Results
026.36.800
12/4/2018

			Existing Peak Discharge				Peak Flow		
Element ID	Area	Area	10yr 30min	10yr 1hr	10yr 3hr	10yr 6hr	Existing	Existing/acre	Peak Storm
	mi^2	acres	cfs	cfs	cfs	cfs	cfs	cfs/ac	
Cherry	0.0506	32.384	21.8	18.2	11.1	10.1	21.8	0.67	30min
CNP1403	0.076	48.64	18.2	20.6	14	10.4	20.6	0.42	1hr
CNP1512	0.067	42.88	17.1	19.1	12.6	9.3	19.1	0.45	1hr
CNP160	0.0113	7.232	3.1	3.5	2.4	2	3.5	0.48	1hr
CNP1602	0.076	48.64	18.4	20.7	14.1	10.4	20.7	0.43	1hr
CNP1701	0.017	10.88	3.9	4.5	3.1	2.3	4.5	0.41	1hr
CN10	0.0281	17.984	25.2	27.5	15.9	10.8	27.5	1.53	1hr
CN11	0.038	24.32	5.1	6.1	6.2	6.3	6.3	0.26	6hr
CN1101b	0.954884	611.1258	234.9	267.2	209.8	179.2	267.2	0.44	1hr
CN1102	0.751177	480.7533	212.9	240.7	180.5	152.1	240.7	0.50	1hr
CN1103	0.536377	343.2813	145.2	164.1	119.4	96.9	164.1	0.48	1hr
CN1103b	0.2148	137.472	74.5	83.2	63.2	55.4	83.2	0.61	1hr
CN1103c	0.27177	173.9328	98.5	110.9	76.8	57.8	110.9	0.64	1hr
CN1103d	0.15937	101.9968	50.6	54	34.3	27.5	54	0.53	1hr
CN1104	0.2001	128.064	65.1	72.6	57.4	50.8	72.6	0.57	1hr
CN111	0.034	21.76	3.3	3.8	2.8	3.2	3.8	0.17	1hr
CN113	0.645659	413.2218	184.5	216.6	165	125.4	216.6	0.52	1hr
CN117	0.0168	10.752	7.1	8.1	5.3	3.8	8.1	0.75	1hr
CN118	0.1179	75.456	26.3	30.5	22.3	18.4	30.5	0.40	1hr
CN118b	0.02636	16.8704	8	9.2	6.1	4.8	9.2	0.55	1hr
CN119	0.0366	23.424	5.1	5.9	4	4	5.9	0.25	1hr
CN119b	0.2073	132.672	22.2	25.4	24.6	25.4	25.4	0.19	1hr
CN12	0.2237	143.168	66.7	75.3	53.3	38.3	75.3	0.53	1hr
CN120	0.2653	169.792	28.6	33.7	31.3	32.4	33.7	0.20	1hr
CN120b	0.35026	224.1664	46.4	54.5	47.3	44.3	54.5	0.24	1hr
CN120c	0.29166	186.6624	35.4	41.1	36.6	36.5	41.1	0.22	1hr
CN1201	0.1646	105.344	39.4	44.4	44.2	39.5	44.4	0.42	1hr
CN1202	0.0908	58.112	51.3	57.3	36.6	25.9	57.3	0.99	1hr
CN1202b	0.0274	17.536	7.8	9.1	6.5	6.1	9.1	0.52	1hr
CN1202c	0.0908	58.112	47.4	53.1	36.2	25.7	53.1	0.91	1hr
CN1203	0.0331	21.184	22.9	25.3	15.6	10.9	25.3	1.19	1hr
CN1203b	0.0331	21.184	21.9	24.4	15.5	10.8	24.4	1.15	1hr
CN1205	0.1153	73.792	28.7	36.7	34.8	30.3	36.7	0.50	1hr
CN121	0	0	7.3	8.1	8.7	9.2	9.2		
CN122	1.056284	676.0218	258.9	298.3	230.1	192.3	298.3	0.44	1hr
CN123b	1.153384	738.1658	249.8	291.7	241.5	205.6	291.7	0.40	1hr
CN13	0.2094	134.016	65.1	73.1	51.4	36.5	73.1	0.55	1hr
CN130	0.1092	69.888	22.7	25.9	17.4	12.3	25.9	0.37	1hr
CN1301	0.0503	32.192	24.4	28.1	22.4	16.2	28.1	0.87	1hr
CN1302b	0.0503	32.192	24.5	28.1	22.4	16.3	28.1	0.87	1hr
CN1302c	0.0503	32.192	25.5	29.1	22.7	16.3	29.1	0.90	1hr
CN1305	0.117899	75.45536	60.5	67.7	47.5	33.9	67.7	0.90	1hr
CN1305b	0	0	0	0	0	0	0		
CN1307	0.1647	105.408	24.5	27.5	23.4	20.7	27.5	0.26	1hr
CN1308	0.0235	15.04	8.9	10.1	6.3	4.4	10.1	0.67	1hr
CN1308b	0.011809	7.55776	1.4	1.6	1.7	1.8	1.8	0.24	6hr
CN131	0.0715	45.76	7.5	9.2	6.7	5.1	9.2	0.20	1hr
CN1311b	0.057468	36.77952	47.5	52.9	34.9	24.4	52.9	1.44	1hr
CN1311c	0.047668	30.50752	41.2	45.7	29	20.1	45.7	1.50	1hr
CN132	0.0888	56.832	10.7	12.8	9.3	7	12.8	0.23	1hr
CN135	0.0107	6.848	1.3	1.4	1.1	0.8	1.4	0.20	1hr
CN136	0.0107	6.848	1.3	1.4	1.1	0.8	1.4	0.20	1hr

			Existing Peak Discharge				Peak Flow		
Element ID	Area	Area	10yr 30min	10yr 1hr	10yr 3hr	10yr 6hr	Existing	Existing/acre	Peak Storm
	mi^2	acres	cfs	cfs	cfs	cfs	cfs	cfs/ac	
CN14	0.0642	41.088	44	48.4	29.9	20.6	48.4	1.18	1hr
CN1403	0.1179	75.456	26.4	30.6	22.4	18.5	30.6	0.41	1hr
CN1404	0.0321	20.544	6.6	7.7	5.4	4.5	7.7	0.37	1hr
CN1404b	0.0284	18.176	5.1	5.9	4.7	4	5.9	0.32	1hr
CN15	0.141	90.24	57.8	64.3	42.3	29.7	64.3	0.71	1hr
CN1501	0.0158	10.112	2.5	2.9	2.1	1.7	2.9	0.29	1hr
CN1502	0.0189	12.096	4.7	5.4	3.7	3.1	5.4	0.45	1hr
CN1503b	0.0503	32.192	27.5	31.2	23.1	16.5	31.2	0.97	1hr
CN1505	0.105	67.2	29.6	33.2	21.2	15.2	33.2	0.49	1hr
CN1505b	0.1647	105.408	25.1	27.9	23.4	20.8	27.9	0.26	1hr
CN1505c	0	0	0	0	0	0	0		
CN1507	0.0593	37.952	20.5	23	14.7	10.3	23	0.61	1hr
CN1512	0	0	0	0	0	0	0		
CN1512b	0.0085	5.44	5.6	6.4	4.2	2.9	6.4	1.18	1hr
CN1512d	0	0	0	0	0	0	0		
CN1513	0.0593	37.952	20.6	23.1	14.8	10.3	23.1	0.61	1hr
CN1514	0.0045	2.88	2.8	3.1	2.2	1.7	3.1	1.08	1hr
CN158	0.4747	303.808	147	174.3	123.3	89	174.3	0.57	1hr
CN159	0.5273	337.472	153.2	185.5	136.6	99.9	185.5	0.55	1hr
CN160	0.6359	406.976	194.4	239.5	173.5	126.2	239.5	0.59	1hr
CN1601	0.0369	23.616	11.1	12.5	7.9	6.8	12.5	0.53	1hr
CN1606	0.0296	18.944	17.3	19.4	14.1	10	19.4	1.02	1hr
CN1606b	0.0381	24.384	22.7	25.7	18.2	12.8	25.7	1.05	1hr
CN161	1.4324	916.736	66.6	76.2	65.8	60.3	76.2	0.08	1hr
CN162	1.4088	901.632	64.3	73.1	62.2	57.5	73.1	0.08	1hr
CN163	0.0625	40	26.6	31.1	26.2	21	31.1	0.78	1hr
CN178	0.0615	39.36	32.7	37.1	24.3	17.2	37.1	0.94	1hr
CN179	1.2759	816.576	32.8	40.8	39.5	41.3	41.3	0.05	6hr
CN180	0.0254	16.256	15.5	17.3	11.1	7.7	17.3	1.06	1hr
CN181	0.3331	213.184	93.4	109.1	77.8	55.8	109.1	0.51	1hr
CN183	0.0146	9.344	3.3	3.8	2.6	2	3.8	0.41	1hr
CN183b	0.0062	3.968	1.3	1.5	1.1	0.8	1.5	0.38	1hr
CN185	0.0527	33.728	42.3	46.8	28.2	19.4	46.8	1.39	1hr
CN193	0.0386	24.704	14.2	16.1	10.4	7.2	16.1	0.65	1hr
CN2	0.1197	76.608	25.8	29.3	19.9	14.1	29.3	0.38	1hr
CN203	0.0226	14.464	4.4	5.2	3.7	4.2	5.2	0.36	1hr
CN208	0.0479	30.656	3.4	4.5	3.5	2.9	4.5	0.15	1hr
CN209	0.0573	36.672	11.9	13.6	9.1	6.4	13.6	0.37	1hr
CN210	0.9881	632.384	98.7	123.5	94.2	72.3	123.5	0.20	1hr
CN2101	0.0754	48.256	29.5	33.1	21.5	17.2	33.1	0.69	1hr
CN2104	0.0279	17.856	11.3	12.7	8	5.7	12.7	0.71	1hr
CN213	0.713	456.32	209.2	256.8	186.5	136.2	256.8	0.56	1hr
CN217	0.1851	118.464	29.8	34.2	24.5	18.3	34.2	0.29	1hr
CN218	0.2112	135.168	33.1	38	27.2	20.3	38	0.28	1hr
CN219	0.098	62.72	11.2	13.4	9.7	7.4	13.4	0.21	1hr
CN22	0.0202	12.928	5.1	5	2.7	1.8	5.1	0.39	30min
CN220	0.098	62.72	11.2	13.4	9.7	7.4	13.4	0.21	1hr
CN221	0.098	62.72	11.2	13.4	9.7	7.4	13.4	0.21	1hr
CN222	0.1605	102.72	25.3	29	20.6	15.2	29	0.28	1hr
CN225	0.1605	102.72	24.7	28.5	20.4	15.1	28.5	0.28	1hr
CN227	0.0367	23.488	6.6	7.5	5.1	4.1	7.5	0.32	1hr
CN230	0.0888	56.832	10.7	12.8	9.2	7	12.8	0.23	1hr
CN232	0.8828	564.992	7.3	8.1	8.7	9.2	9.2	0.02	6hr
CN233	0.0058	3.712	0.4	0.4	0.3	0.4	0.4	0.11	30min
CN234	0.0621	39.744	9.3	10.4	7.3	7.3	10.4	0.26	1hr
CN234b	0.0679	43.456	9.6	10.7	7.5	7.6	10.7	0.25	1hr
CN248	0.1516	97.024	32.8	37.3	25.7	18	37.3	0.38	1hr

			Existing Peak Discharge				Peak Flow		
Element ID	Area	Area	10yr 30min	10yr 1hr	10yr 3hr	10yr 6hr	Existing	Existing/acre	Peak Storm
	mi^2	acres	cfs	cfs	cfs	cfs	cfs	cfs/ac	
CN250	1.4532	930.048	70.9	81.1	69.2	63	81.1	0.09	1hr
CN255	1.354	866.56	60.7	69.1	57.5	51.9	69.1	0.08	1hr
CN256	0.7572	484.608	8.8	9.9	11.2	12.6	12.6	0.03	6hr
CN258	1.334	853.76	61.9	69.8	56.4	50.4	69.8	0.08	1hr
CN259	0.3089	197.696	86.1	100.2	70.7	50.5	100.2	0.51	1hr
CN260	0.2478	158.592	47.7	55.2	39	27.9	55.2	0.35	1hr
CN261	0.0245	15.68	1.6	1.8	1.7	2.5	2.5	0.16	6hr
CN261b	0.0184	11.776	7.3	8.4	5.6	4.6	8.4	0.71	1hr
CN261c	0.1889	120.896	17.4	20.4	20.7	21.9	21.9	0.18	6hr
CN261d	0.1179	75.456	26.1	30.3	22.2	18.3	30.3	0.40	1hr
CN262	0.3331	213.184	92.6	107.9	77.4	55.6	107.9	0.51	1hr
CN263	0.3685	235.84	104.4	121.3	87.9	63.9	121.3	0.51	1hr
CN264	0.4668	298.752	147.2	171.3	124.6	91.7	171.3	0.57	1hr
CN265	0.4668	298.752	147.1	170.9	124.5	91.7	170.9	0.57	1hr
CN266	0.0107	6.848	1.3	1.5	1.1	0.8	1.5	0.22	1hr
CN267	0.0107	6.848	1.3	1.5	1.1	0.8	1.5	0.22	1hr
CN270	0.7781	497.984	216.4	247.5	173.4	126.7	247.5	0.50	1hr
CN271	0.826	528.64	223.9	256.3	180.8	132.9	256.3	0.48	1hr
CN272	0.826	528.64	224.8	257	181.3	133	257	0.49	1hr
CN273	0.0253	16.192	25.6	27.8	16.5	11.2	27.8	1.72	1hr
CN274	0.0523	33.472	41.9	46	27.9	19	46	1.37	1hr
CN275	0.0753	48.192	45.7	50.5	31.7	22	50.5	1.05	1hr
CN276	0.0887	56.768	46.4	51.4	33.5	23.4	51.4	0.91	1hr
CN278	0.1757	112.448	63	70.3	47.2	33.2	70.3	0.63	1hr
CN279	0.2237	143.168	67.5	75.9	53.7	38.3	75.9	0.53	1hr
CN280	0.2356	150.784	67.6	76.5	54.9	39.4	76.5	0.51	1hr
CN281	0.2632	168.448	71.5	81.2	59	42.6	81.2	0.48	1hr
CN281b	0.0237	15.168	12	14.4	11.5	8.6	14.4	0.95	1hr
CN283	0.0097	6.208	1.6	1.8	1.3	1	1.8	0.29	1hr
CN284	0.0742	47.488	12.6	14.3	9.7	6.9	14.3	0.30	1hr
CN285	0.0977	62.528	17.8	20.2	13.5	9.6	20.2	0.32	1hr
CN286	0.1445	92.48	28	31.9	21.4	15.1	31.9	0.34	1hr
CN289	0.0151	9.664	1.8	2	1.5	1.1	2	0.21	1hr
CN290	0.0445	28.48	8.7	9.8	7.3	5.3	9.8	0.34	1hr
CN292	0.0067	4.288	1.1	1.2	0.9	0.7	1.2	0.28	1hr
CN293	0.0067	4.288	1.1	1.2	0.9	0.7	1.2	0.28	1hr
CN294	0.021	13.44	6.5	6.8	4.3	3.3	6.8	0.51	1hr
CN297	0.713	456.32	211.6	259.3	187.3	136.5	259.3	0.57	1hr
CN298	0.7572	484.608	8.8	9.9	11.2	12.6	12.6	0.03	6hr
CN299	0.7714	493.696	13.5	15.5	13.8	13.5	15.5	0.03	1hr
CN3	0.052	33.28	13.4	16.1	16.2	13.6	16.2	0.49	3hr
CN301	0.7836	501.504	19.1	22.3	20.1	18.1	22.3	0.04	1hr
CN304	1.0959	701.376	44.4	52.1	55.5	57.2	57.2	0.08	6hr
CN306	1.0994	703.616	44.5	52.5	55.9	57.7	57.7	0.08	6hr
CN307	0.0215	13.76	7.4	10	7.9	5.7	10	0.73	1hr
CN308	0.015	9.6	4.9	5.6	3.2	2.2	5.6	0.58	1hr
CN309	0.0471	30.144	13.8	15.6	9	6.4	15.6	0.52	1hr
CN310	0.0471	30.144	14.1	15.8	9	6.4	15.8	0.52	1hr
CN3101	0.0715	45.76	45.7	50.9	33.5	26.6	50.9	1.11	1hr
CN3104	0.0311	19.904	21.8	24.2	15.9	11.7	24.2	1.22	1hr
CN3105	0.0438	28.032	44.4	48.3	28.6	19.9	48.3	1.72	1hr
CN311	0	0	0	0	0	0	0		
CN312	0.017	10.88	1.7	1.9	2.1	2.2	2.2	0.20	6hr
CN313	1.347	862.08	60.5	68.7	57.1	51.3	68.7	0.08	1hr
CN315	0.0398	25.472	4.1	4.7	5	5.2	5.2	0.20	6hr
CN317	0.1624	103.936	34.6	39.4	27.3	19.4	39.4	0.38	1hr
CN319	0.0241	15.424	5.3	6.1	4	2.8	6.1	0.40	1hr

			Existing Peak Discharge				Peak Flow		
Element ID	Area	Area	10yr 30min	10yr 1hr	10yr 3hr	10yr 6hr	Existing	Existing/acre	Peak Storm
	mi^2	acres	cfs	cfs	cfs	cfs	cfs	cfs/ac	
CN320	0.1048	67.072	22.9	26	17.8	12.4	26	0.39	1hr
CN3203	0.0081	5.184	6.6	7.5	4.9	3.5	7.5	1.45	1hr
CN3203b	0.0428	27.392	38.5	42.6	26.5	18.7	42.6	1.56	1hr
CN3204	0	0	0	0	0	0	0		
CN3205	0.0047	3.008	4	4.6	3.1	2.2	4.6	1.53	1hr
CN321	0.0458	29.312	11.2	12.5	8.4	5.8	12.5	0.43	1hr
CN322	0.0275	17.6	5.4	6.1	4	2.8	6.1	0.35	1hr
CN324	0.0298	19.072	6.9	7.8	5	3.6	7.8	0.41	1hr
CN325	0.0162	10.368	3.6	4.1	2.8	2	4.1	0.40	1hr
CN325b	0.052	33.28	16.4	18.7	12.6	9	18.7	0.56	1hr
CN326	0.0162	10.368	3.6	4.1	2.8	2	4.1	0.40	1hr
CN328	0.034	21.76	4.9	5.6	3.8	2.7	5.6	0.26	1hr
CN329	0.012	7.68	1.4	1.7	1.3	1.3	1.7	0.22	1hr
CN331	1.6692	1068.288	113.3	129.9	105.2	88.8	129.9	0.12	1hr
CN336	0.0486	31.104	10.8	12.3	8.4	5.9	12.3	0.40	1hr
CN337	0.0274	17.536	6	6.9	4.7	3.3	6.9	0.39	1hr
CN339	1.7604	1126.656	124.8	145.7	122.9	103.8	145.7	0.13	1hr
CN343	0.0149	9.536	8	9.1	5.8	4	9.1	0.95	1hr
CN344	0.0347	22.208	11.8	13.4	8.8	6.1	13.4	0.60	1hr
CN345	0.06823	43.6672	5.9	7.3	7.8	8.3	8.3	0.19	6hr
CN348	0	0	0	0	0	0	0		
CN349	0.6914	442.496	210.7	240.7	167.6	121.9	240.7	0.54	1hr
CN350	0.7124	455.936	214.7	245.1	171.2	124.4	245.1	0.54	1hr
CN351	0.0657	42.048	3.3	3.7	2.9	3	3.7	0.09	1hr
CN352	0.7886	504.704	219.3	250.3	175.4	128.3	250.3	0.50	1hr
CN353	0.0978	62.592	29.8	32.3	18.6	12.5	32.3	0.52	1hr
CN354	0.1171	74.944	35.4	38.7	22.9	15.6	38.7	0.52	1hr
CN355	0.1626	104.064	83.6	94.7	65.4	48	94.7	0.91	1hr
CN356	0.0368	23.552	22.5	23.8	14.1	9.6	23.8	1.01	1hr
CN358	0.0459	29.376	9.5	10.9	7.6	5.5	10.9	0.37	1hr
CN359	0.1202	76.928	22.3	25.2	17.6	13.2	25.2	0.33	1hr
CN360	0.1842	117.888	35.2	40.1	26.9	19.1	40.1	0.34	1hr
CN361	0.0399	25.536	4.7	5.4	3.6	2.6	5.4	0.21	1hr
CN362	0.121	77.44	35	37.4	21.2	14.3	37.4	0.48	1hr
CN366	0.826	528.64	223.8	256	180.7	132.9	256	0.48	1hr
CN367	0.8822	564.608	9.3	13.4	17.3	23.1	23.1	0.04	6hr
CN368	0.1389	88.896	46.1	50.9	30.7	21.1	50.9	0.57	1hr
CN369	0.1389	88.896	46.9	51.4	31	21.2	51.4	0.58	1hr
CN370	0.9138	584.832	42.9	47.9	28.2	27.6	47.9	0.08	1hr
CN372	0.1339	85.696	20.7	23.9	16.9	14.3	23.9	0.28	1hr
CN373East	0.0343	21.952	5.4	6.2	4.1	2.9	6.2	0.28	1hr
CN376	0.0141	9.024	2.5	2.8	1.9	1.8	2.8	0.31	1hr
CN377	0.0124	7.936	2.9	3.4	2.4	1.7	3.4	0.43	1hr
CN378	0.0381	24.384	18.2	20.5	13.4	9.4	20.5	0.84	1hr
CN379	0.1094	70.016	24.5	27.8	18.7	13.2	27.8	0.40	1hr
CN380	0.0347	22.208	12	13.7	9	6.3	13.7	0.62	1hr
CN382	0.0798	51.072	38.7	43.8	28.9	20.9	43.8	0.86	1hr
CN383	0.0433	27.712	36.4	40	24.7	16.8	40	1.44	1hr
CN384	0.0433	27.712	36.3	39.7	24.5	16.8	39.7	1.43	1hr
CN386	0.107	68.48	36.7	41.6	31.6	24.4	41.6	0.61	1hr
CN387	1.103684	706.3578	245.2	285.4	235.6	200.1	285.4	0.40	1hr
CN388	0.0414	26.496	20.5	24	19.8	15.4	24	0.91	1hr
CN389	0.0516	33.024	24.8	28.1	18.1	12.9	28.1	0.85	1hr
CN390	0.0267	17.088	14.2	16.9	13.4	10	16.9	0.99	1hr
CN391	0.0414	26.496	20.6	24.1	19.8	15.4	24.1	0.91	1hr
CN396	1.1834	757.376	11.5	12.9	14.3	15.7	15.7	0.02	6hr
CN397	0.212159	135.7818	57.8	63.5	41.9	31.4	63.5	0.47	1hr

			Existing Peak Discharge				Peak Flow		
Element ID	Area	Area	10yr 30min	10yr 1hr	10yr 3hr	10yr 6hr	Existing	Existing/acre	Peak Storm
	mi^2	acres	cfs	cfs	cfs	cfs	cfs	cfs/ac	
CN4	0.0094	6.016	2.1	2.4	2.1	1.9	2.4	0.40	1hr
CN402	0.537159	343.7818	138.5	164.1	128.9	98.6	164.1	0.48	1hr
CN404	0.311759	199.5258	76.8	87.4	60.7	45.5	87.4	0.44	1hr
CN407	0.0818	52.352	30.3	33.6	22.1	16.5	33.6	0.64	1hr
CN409	0.1978	126.592	60	70.7	55.7	42.4	70.7	0.56	1hr
CN415	0.0038	2.432	0.6	0.5	0.3	0.2	0.6	0.25	30min
CN416	0.034	21.76	14.5	15.6	9.7	7.1	15.6	0.72	1hr
CN417	0.0586	37.504	19.5	21.6	14.1	10.9	21.6	0.58	1hr
CN418	0.0818	52.352	30.2	33.5	22	16.4	33.5	0.64	1hr
CN420	0.0302	19.328	26	29.2	18.9	13	29.2	1.51	1hr
CN421	0.007	4.48	6.4	7.3	4.7	3.3	7.3	1.63	1hr
CN422	0.0163	10.432	16	17.7	11.1	7.6	17.7	1.70	1hr
CN423	0.0364	23.296	29.8	33.2	20.8	14.2	33.2	1.43	1hr
CN425	0.240259	153.7658	60	66.9	45	34	66.9	0.44	1hr
CN426	0.179759	115.0458	51	55.5	36.3	27.3	55.5	0.48	1hr
CN427	0.156759	100.3258	46.3	49.7	31.9	24.3	49.7	0.50	1hr
CN428	0.1239	79.296	41.2	43.5	27.5	21.1	43.5	0.55	1hr
CN431	0.2174	139.136	65.9	79.4	65.3	50.1	79.4	0.57	1hr
CN432	0.1887	120.768	59.3	69.4	54.1	40.9	69.4	0.57	1hr
CN433	0.1514	96.896	48.9	56.9	43.2	32.1	56.9	0.59	1hr
CN434	0.1372	87.808	41.8	48.1	36.1	26.7	48.1	0.55	1hr
CN447	0.3362	215.168	106	117.1	86.4	66.5	117.1	0.54	1hr
CN448	0.0221	14.144	7.4	7	3.6	2.4	7.4	0.52	30min
CN449	0.0366	23.424	12.4	12.3	6.4	4.4	12.4	0.53	30min
CN450	0.0059	3.776	2.1	2.4	1.5	1.1	2.4	0.64	1hr
CN451	0.0321	20.544	4.1	5.1	4.9	4.7	5.1	0.25	1hr
CN452	0.0194	12.416	2.9	3.7	3.7	3.7	3.7	0.30	1hr
CN453	0.0515	32.96	6.9	8.8	8.6	8.4	8.8	0.27	1hr
CN454	0.0714	45.696	15	16.8	14.5	13.4	16.8	0.37	1hr
CN455	0.1419	90.816	34.5	37.2	25.5	21.2	37.2	0.41	1hr
CN457	0.1648	105.472	38.8	43.3	30.7	25.9	43.3	0.41	1hr
CN458	0.0059	3.776	2.1	2.4	1.5	1	2.4	0.64	1hr
CN459	0.0248	15.872	7.4	7.4	4.7	3.8	7.4	0.47	30min
CN460	0.0794	50.816	19.3	23.2	17.9	13.4	23.2	0.46	1hr
CN461	0.2525	161.6	52.9	62.5	49.3	39.9	62.5	0.39	1hr
CN463	0.0149	9.536	22.4	21.1	10.6	7.1	22.4	2.35	30min
CN464	0.014	8.96	22.2	20.1	9.9	6.5	22.2	2.48	30min
CN465	0.0362	23.168	11.8	13.4	10.7	9.2	13.4	0.58	1hr
CN466	0.0654	41.856	38.1	42.5	29.5	22.4	42.5	1.02	1hr
CN467	0.0841	53.824	54.6	59.1	40.8	30.7	59.1	1.10	1hr
CN468	0.4675	299.2	203.3	223.9	157.5	117.7	223.9	0.75	1hr
CN469	0.4902	313.728	212.8	236.4	168.1	125.4	236.4	0.75	1hr
CN470	0.5057	323.648	210.8	236.2	169	126.7	236.2	0.73	1hr
CN471	0.5248	335.872	217.3	245.8	177.3	133.6	245.8	0.73	1hr
CN472	0.1215	77.76	14.3	16.3	11.6	8.6	16.3	0.21	1hr
CN473	0.0112	7.168	7	7.1	3.7	2.5	7.1	0.99	1hr
CN474	0.0512	32.768	15.1	16.3	10.1	6.9	16.3	0.50	1hr
CN475	0.5959	381.376	233.6	264.1	190.3	142.8	264.1	0.69	1hr
CN476	0.6089	389.696	232.7	264.5	192.9	145	264.5	0.68	1hr
CN477	0.6423	411.072	238.6	272.3	199.7	150.4	272.3	0.66	1hr
CN478	0.659	421.76	236.6	271.5	200.5	151.6	271.5	0.64	1hr
CN479	0.0129	8.256	0.7	0.7	0.4	0.4	0.7	0.08	30min
CN480	0.032	20.48	6.2	7	4.8	3.4	7	0.34	1hr
CN481	0.0076	4.864	1.8	2	1.2	0.8	2	0.41	1hr
CN482	0.035	22.4	55.1	45.3	21.3	14	55.1	2.46	30min
CN483	0.055	35.2	66	61.6	33.3	22.7	66	1.88	30min
CN484	0.0797	51.008	84.7	79	42.8	29.2	84.7	1.66	30min

			Existing Peak Discharge				Peak Flow		
Element ID	Area	Area	10yr 30min	10yr 1hr	10yr 3hr	10yr 6hr	Existing	Existing/acre	Peak Storm
	mi^2	acres	cfs	cfs	cfs	cfs	cfs	cfs/ac	
CN485	0.1261	80.704	87.6	85.5	49.1	34.7	87.6	1.09	30min
CN486	0.1472	94.208	103.7	103.9	60.4	42.7	103.9	1.10	1hr
CN487	0.1792	114.688	103.3	107.3	64.7	45.8	107.3	0.94	1hr
CN488	0.0218	13.952	4.2	4.2	4.2	4.2	4.2	0.30	30min
CN489	0.0788	50.432	24.7	24.2	14.6	12.5	24.7	0.49	30min
CN491	0.1485	95.04	37	37.5	25.7	22.4	37.5	0.39	1hr
CN492	0.2612	167.168	63.6	69.8	51.8	43.3	69.8	0.42	1hr
CN493	0.2612	167.168	62.5	69	51.5	43.1	69	0.41	1hr
CN494	0.2823	180.672	69.8	79	58.8	48.8	79	0.44	1hr
CN495	0.0142	9.088	1.8	2.2	2.2	2	2.2	0.24	1hr
CN496	0.0157	10.048	2.5	3	3	3	3	0.30	1hr
CN497	0.0075	4.8	0.6	0.8	0.8	1.1	1.1	0.23	6hr
CN498	0.0103	6.592	2.2	2.5	1.8	1.3	2.5	0.38	1hr
CN500	0.1002	64.128	28.2	31.8	23.8	19	31.8	0.50	1hr
CN501	0.0208	13.312	10.2	9.7	5	3.3	10.2	0.77	30min
CN502	0.0043	2.752	0.4	0.5	0.4	0.4	0.5	0.18	1hr
CN503	0.015	9.6	1.8	2.2	2	1.6	2.2	0.23	1hr
CN504	0.015	9.6	1.8	2.2	2	1.6	2.2	0.23	1hr
CN505	0.0396	25.344	15.8	17.7	11	7.6	17.7	0.70	1hr
CN506	0.0396	25.344	15.2	17	10.9	7.6	17	0.67	1hr
CN507	0.6809	435.776	242.9	279.9	208.1	157.3	279.9	0.64	1hr
CN508	0.0043	2.752	0.4	0.5	0.4	0.4	0.5	0.18	1hr
CN510	0.0477	30.528	15	15	8	5.5	15	0.49	30min
CN511	0.0564	36.096	17	17.5	9.8	6.7	17.5	0.48	1hr
CN512	0.0215	13.76	4.6	5.8	4.9	3.7	5.8	0.42	1hr
CN513	0.0334	21.376	6.9	8.4	7.4	5.7	8.4	0.39	1hr
CN514	0.0186	11.904	6.3	6.8	4.1	3	6.8	0.57	1hr
CN515	0.0157	10.048	2.7	3	1.9	1.4	3	0.30	1hr
CN516	0.0052	3.328	8.8	7.8	3.8	2.5	8.8	2.64	30min
CN517	0.0161	10.304	3	2.6	1.2	0.8	3	0.29	30min
CN519	0.0209	13.376	5.4	5.7	3.2	2.2	5.7	0.43	1hr
CN520	0.0271	17.344	4.4	5	3.5	2.5	5	0.29	1hr
CN521	0.0465	29.76	8.2	9.4	6.5	5	9.4	0.32	1hr
CN522	0.0542	34.688	11.7	12.9	9	6.9	12.9	0.37	1hr
CN523	0.0117	7.488	3.6	3.6	1.9	1.3	3.6	0.48	30min
CN524	0.012	7.68	3	3.3	1.9	1.3	3.3	0.43	1hr
CN525	0.0185	11.84	10.3	10.1	5.2	3.5	10.3	0.87	30min
CN526	0.0094	6.016	3.2	3.4	2	1.5	3.4	0.57	1hr
CN527	0.0176	11.264	15.5	17.5	10.6	7.2	17.5	1.55	1hr
CN528	0.0234	14.976	6.2	7.3	5.6	4	7.3	0.49	1hr
CN529	0.0104	6.656	2	2.3	1.7	1.2	2.3	0.35	1hr
CN530	0.0286	18.304	10.4	11.9	7.9	5.5	11.9	0.65	1hr
CN531	0.0257	16.448	3.1	3.5	3.6	3.7	3.7	0.22	6hr
CN532	0.0213	13.632	4.4	5.1	3.4	2.4	5.1	0.37	1hr
CN533	1.2107	774.848	21.1	23.4	25.5	27.6	27.6	0.04	6hr
CN534	1.2702	812.928	29.6	33.5	32.3	32.4	33.5	0.04	1hr
CN536	0.0397	25.408	9.5	12.1	9.6	8	12.1	0.48	1hr
CN537	0.0168	10.752	4.2	4.9	3.3	2.3	4.9	0.46	1hr
CN538	0.0156	9.984	3.1	3.5	2.4	1.7	3.5	0.35	1hr
CN540	0.1395	89.28	61.5	72	58.8	46.5	72	0.81	1hr
CN542	0	0	0	0	0	0	0		
CN543	0.0117	7.488	2	2.3	1.6	1.2	2.3	0.31	1hr
CN545	0.0211	13.504	5.2	5.2	3.3	2.3	5.2	0.39	30min
CN546	0.103	65.92	54.5	67.5	47.8	34	67.5	1.02	1hr
CN547	0.1391	89.024	67.1	83.3	59.3	42.1	83.3	0.94	1hr
CN548	1.0959	701.376	44.3	52.1	55.5	57.2	57.2	0.08	6hr
CN548b	0.1166	74.624	49.6	57.9	47.3	37.2	57.9	0.78	1hr

			Existing Peak Discharge				Peak Flow		
Element ID	Area	Area	10yr 30min	10yr 1hr	10yr 3hr	10yr 6hr	Existing	Existing/acre	Peak Storm
	mi^2	acres	cfs	cfs	cfs	cfs	cfs	cfs/ac	
CN551	1.0959	701.376	44.4	52.1	55.5	57.2	57.2	0.08	6hr
CN555	1.06	678.4	42.1	49.6	53.2	55	55	0.08	6hr
CN556	1.06	678.4	42	49.6	53.2	55	55	0.08	6hr
CN562	0.0551	35.264	7.6	8.7	6.2	4.8	8.7	0.25	1hr
CN572	1.1615	743.36	22.8	28.5	30.3	33.6	33.6	0.05	6hr
CN584	0.0155	9.92	6	6.8	4.8	3.4	6.8	0.69	1hr
CN587	0.0259	16.576	5.8	6.6	4.4	3.2	6.6	0.40	1hr
CN61	0.2193	140.352	66.4	80.1	66	50.8	80.1	0.57	1hr
CN624b	0.1086	69.504	33.6	38.8	28.7	21.3	38.8	0.56	1hr
CN635	0.3572	228.608	95.3	110.7	80.5	58.7	110.7	0.48	1hr
CN655	0.0163	10.432	7.7	9.3	7.4	5.6	9.3	0.89	1hr
CN656	0.0098	6.272	4.3	5.1	4.1	3.1	5.1	0.81	1hr
CV557	0.205	131.2	68	74.4	44.1	30.1	74.4	0.57	1hr
CV558	0.205	131.2	66.9	73.5	44	30.1	73.5	0.56	1hr
CV559	0.1294	82.816	26	29.7	20	14.2	29.7	0.36	1hr
CV560	0.1476	94.464	27	30.9	21	14.9	30.9	0.33	1hr
CV561	0.1624	103.936	35	39.8	27.5	19.4	39.8	0.38	1hr
CV562	0.0628	40.192	8.3	9.6	8.4	7.7	9.6	0.24	1hr
CV563	0.0628	40.192	8.3	9.6	8.3	7.7	9.6	0.24	1hr
CV564	0.0299	19.136	4.3	5.2	5.2	5	5.2	0.27	1hr
CV565	0.0299	19.136	4.3	5.2	5.2	5	5.2	0.27	1hr
CV566	0.07	44.8	12.6	14.1	9.7	7.4	14.1	0.31	1hr
CV567	0.0743	47.552	12.8	14.4	10.2	7.8	14.4	0.30	1hr
CV569	0.0252	16.128	12.3	14.3	9.9	8.5	14.3	0.89	1hr
CV571	0.0252	16.128	12.4	14.3	9.9	8.5	14.3	0.89	1hr
CV572	0.0815	52.16	37.7	42.4	29.4	21.5	42.4	0.81	1hr
CV573	0.0815	52.16	34.5	39.1	28.7	21.3	39.1	0.75	1hr
CV574	0.075	48	8.4	9.6	6.9	5.1	9.6	0.20	1hr
CV575	0.096	61.44	10.1	11.5	8.2	6.1	11.5	0.19	1hr
CV576	0.0283	18.112	7.8	8.2	4.9	4	8.2	0.45	1hr
CV577	0.07	44.8	13.3	14.9	9.8	7.4	14.9	0.33	1hr
CV578	0.0244	15.616	4.7	5.3	3.7	2.6	5.3	0.34	1hr
CV579	0.0326	20.864	6.6	7.6	5.3	3.8	7.6	0.36	1hr
CV580	0.0179	11.456	2.8	3.2	2.3	1.6	3.2	0.28	1hr
CV581	0.0313	20.032	5.6	5.7	4	3	5.7	0.28	1hr
CV582	0.0771	49.344	38.2	40.9	24.9	17.5	40.9	0.83	1hr
CV583	0.1119	71.616	52.9	57.3	35.7	25	57.3	0.80	1hr
CV584	0.042	26.88	15.2	14.5	8.9	6.8	15.2	0.57	30min
CV585	0.054	34.56	17.4	17.4	10.7	8.1	17.4	0.50	30min
CV586	0.0818	52.352	26	27.2	16.8	12.2	27.2	0.52	1hr
CV587	0.1239	79.296	45.2	45.7	27.6	21.1	45.7	0.58	1hr
CV589	0.0021	1.344	3.2	3	1.5	1	3.2	2.38	30min
CV591	0.2198	140.672	8.5	9.1	8.5	9.1	9.1	0.06	1hr
CV592	0.1778	113.792	6	6	6	6	6	0.05	30min
CV593	0.1944	124.416	6.3	6.3	6.3	6.6	6.6	0.05	6hr
CV594	0.0143	9.152	3.7	4.1	2.5	2	4.1	0.45	1hr
CV603	0.0652	41.728	16.9	18.7	12.1	8.4	18.7	0.45	1hr
CV605	0.0652	41.728	16.6	18.4	12.1	8.4	18.4	0.44	1hr
CV607	0	0	0	0	0	0	0		
CV608	0	0	0	0	0	0	0		
CV612	0.0365	23.36	6.4	6.2	6.1	6.1	6.4	0.27	30min
CV613	0.0537	34.368	15.9	15.3	9.8	9.1	15.9	0.46	30min
CV616	0.0501	32.064	7.6	9.6	9.1	7.5	9.6	0.30	1hr
CV617	0.0697	44.608	13.8	13.9	11.5	9.9	13.9	0.31	1hr
CV621	1.8568	1188.352	141.6	173.5	158.5	132.9	173.5	0.15	1hr
CV622	1.8901	1209.664	152.8	187.8	171.4	142	187.8	0.16	1hr
CV623	1.9064	1220.096	154.8	190.3	173.5	143.6	190.3	0.16	1hr

			Existing Peak Discharge				Peak Flow		
Element ID	Area	Area	10yr 30min	10yr 1hr	10yr 3hr	10yr 6hr	Existing	Existing/acre	Peak Storm
	mi^2	acres	cfs	cfs	cfs	cfs	cfs	cfs/ac	
CV624	1.9064	1220.096	154.7	190.2	173.4	143.5	190.2	0.16	1hr
CV628	0.0432	27.648	13.9	16	12.1	10.1	16	0.58	1hr
CV629	0.0432	27.648	13.8	15.9	12	10.1	15.9	0.58	1hr
CV630	1.2551	803.264	30.7	38.3	37.7	39.8	39.8	0.05	6hr
CV631	1.2678	811.392	31.8	39.6	38.6	40.6	40.6	0.05	6hr
CV632	1.2678	811.392	31.7	39.6	38.6	40.6	40.6	0.05	6hr
CV633	1.2759	816.576	32.9	40.9	39.5	41.3	41.3	0.05	6hr
CV636	0.2852	182.528	59.5	70.9	55.9	44.7	70.9	0.39	1hr
CV637	0.2852	182.528	59.4	70.6	55.8	44.6	70.6	0.39	1hr
CV639	0.1947	124.608	40.8	46.5	33.4	23.9	46.5	0.37	1hr
CV640	0.216	138.24	44.3	50.6	36.4	26.2	50.6	0.37	1hr
CV642	0.2066	132.224	75.2	90.1	71.1	57.6	90.1	0.68	1hr
CV643	0.2536	162.304	112.5	127.5	95.3	74.2	127.5	0.79	1hr
CV644	0.286	183.04	27	37.7	44.4	48.9	48.9	0.27	6hr
CV645	0.302	193.28	28.3	39.8	47	51.8	51.8	0.27	6hr
CV646	0	0	0	0	0	0	0		
DBT1102b	0.011334	7.25376	1.2	1.3	1.3	1.4	1.4	0.19	6hr
DBT1102c	0.029993	19.19552	3.5	3.8	3.3	3	3.8	0.20	1hr
DBT1102e	0.018848	12.06272	2.2	2.4	2.4	2.3	2.4	0.20	1hr
DBT1103b	0.030915	19.7856	3.6	3.9	3.5	3	3.9	0.20	1hr
DB1	0.8828	564.992	14.7	16.2	17.3	18.5	18.5	0.03	6hr
DB1102f	0.008995	5.7568	1.1	1.2	1.2	1.2	1.2	0.21	1hr
DB1103	0.042	26.88	6.7	7.3	7.4	7.4	7.4	0.28	3hr
DB1308	0.011809	7.55776	1.4	1.6	1.7	1.8	1.8	0.24	6hr
DB1505	0.105	67.2	15.2	16.9	15.4	13.6	16.9	0.25	1hr
DB174	0.0172	11.008	2.2	2.5	2.6	2.6	2.6	0.24	3hr
DB175	0.015	9.6	0.7	1.6	1.8	1.9	1.9	0.20	6hr
DB195	0	0	0	0	0	0	0		
DB2	1.1834	757.376	11.5	12.9	14.3	15.7	15.7	0.02	6hr
DB261	0.1889	120.896	17.5	20.5	20.7	21.9	21.9	0.18	6hr
DB3	0.7572	484.608	8.8	9.9	11.2	12.6	12.6	0.03	6hr
DB4	1.06	678.4	42.1	49.6	53.2	55	55	0.08	6hr
DB408	0.0273	17.472	2.4	2.7	3	3.2	3.2	0.18	6hr
DB409	0.017	10.88	1.7	1.9	2.1	2.2	2.2	0.20	6hr
DB420	0.286	183.04	27	37.7	44.5	49	49	0.27	6hr
DB479	0.0085	5.44	0.9	1	1.1	1.1	1.1	0.20	3hr
DB5East	0.8822	564.608	9.5	13.4	17.3	23.1	23.1	0.04	6hr
DB5South	0.0369	23.616	3.6	4.2	4.5	4.6	4.6	0.19	6hr
DB531a	0.0069	4.416	0.6	0.7	0.8	0.9	0.9	0.20	6hr
DB531b	0.0177	11.328	1.1	1.4	1.8	2	2	0.18	6hr
DB539	0.0255	16.32	2.9	3.2	3.4	3.5	3.5	0.21	6hr
DB54	0.013	8.32	1.2	1.4	1.5	1.6	1.6	0.19	6hr
DB55	0.007	4.48	0.6	0.7	0.7	0.8	0.8	0.18	6hr
DB572	1.1615	743.36	22.8	28.5	30.3	33.7	33.7	0.05	6hr
DB578	0.1268	81.152	72.8	80.6	65.9	53.7	80.6	0.99	1hr
DB583	0.0202	12.928	2.1	2.4	2.5	2.6	2.6	0.20	6hr
DB598	0.0398	25.472	4.1	4.7	5	5.2	5.2	0.20	6hr
DB624	0.0155	9.92	1.6	2	2.2	2.2	2.2	0.22	3hr
DB664	0	0	0	0	0	0	0		
DH1	0.8828	564.992	7.3	8.1	8.7	9.2	9.2	0.02	6hr
DH2	0	0	0	0	0	0	0		
DH4	0.1778	113.792	6	6	6	6	6	0.05	30min
DirEast	0.00056	0.3584	0.6	0.5	0.2	0.2	0.6	1.67	30min
DirWest	0.0033	2.112	2.6	2.9	1.8	1.3	2.9	1.37	1hr
DP157	0.0635	40.64	25.9	29.3	19.1	15.4	29.3	0.72	1hr
FGandC	0.00346	2.2144	1.6	1.5	0.8	0.6	1.6	0.72	30min
GOLF	0	0	40.5	45.4	25.1	15.5	45.4		

			Existing Peak Discharge				Peak Flow		
Element ID	Area	Area	10yr 30min	10yr 1hr	10yr 3hr	10yr 6hr	Existing	Existing/acre	Peak Storm
	mi^2	acres	cfs	cfs	cfs	cfs	cfs	cfs/ac	
HC1	0.042	26.88	15.4	14.5	8.9	6.8	15.4	0.57	30min
HC10	0.0465	29.76	8.2	9.4	6.5	5	9.4	0.32	1hr
HC101	0.7572	484.608	213.8	262.4	190.8	139.5	262.4	0.54	1hr
HC102	0.1391	89.024	67.5	83.7	59.4	42.2	83.7	0.94	1hr
HC103	0.9881	632.384	98.7	124	94.3	72.5	124	0.20	1hr
HC106	0.7714	493.696	13.6	15.6	13.9	13.5	15.6	0.03	1hr
HC107	0.7836	501.504	19.2	22.3	20.1	18.1	22.3	0.04	1hr
HC108	0.0471	30.144	14.4	16.1	9.2	6.4	16.1	0.53	1hr
HC109	1.0959	701.376	44.4	52.1	55.5	57.3	57.3	0.08	6hr
HC11	0.537159	343.7818	138.5	164.1	128.9	98.6	164.1	0.48	1hr
HC110	1.0959	701.376	44.4	52.1	55.5	57.2	57.2	0.08	6hr
HC111	1.0959	701.376	44.4	52.1	55.5	57.2	57.2	0.08	6hr
HC112	1.0994	703.616	44.5	52.5	55.9	57.7	57.7	0.08	6hr
HC114	1.3369	855.616	54.4	65.1	64.9	65.2	65.2	0.08	6hr
HC115	0.713	456.32	212.6	260.9	188	136.7	260.9	0.57	1hr
HC116	0.2277	145.728	126.3	148.1	90.9	61.4	148.1	1.02	1hr
HC117	1.1834	757.376	11.5	12.9	14.3	15.7	15.7	0.02	6hr
HC118	0.0742	47.488	12.7	14.4	9.7	6.9	14.4	0.30	1hr
HC119	0.0977	62.528	17.9	20.2	13.6	9.7	20.2	0.32	1hr
HC12	0.645659	413.2218	185.5	217.8	165.8	125.7	217.8	0.53	1hr
HC120	0.1445	92.48	28	31.9	21.4	15.1	31.9	0.34	1hr
HC121	0.2356	150.784	48	54.9	37	26.1	54.9	0.36	1hr
HC122	0.1842	117.888	35.3	40.2	27.1	19.1	40.2	0.34	1hr
HC123	0.2478	158.592	48.7	56.5	39.2	28.1	56.5	0.36	1hr
HC124	0.3089	197.696	86.6	101.1	71	50.6	101.1	0.51	1hr
HC125	0.4668	298.752	147.7	171.7	124.8	91.9	171.7	0.57	1hr
HC126	0.205	131.2	68.3	74.5	44.3	30.2	74.5	0.57	1hr
HC127	0.6914	442.496	211.7	241.2	168	121.9	241.2	0.55	1hr
HC128	0.7886	504.704	219.4	251	175.8	128.4	251	0.50	1hr
HC129	0.1171	74.944	35.8	39.1	23.1	15.6	39.1	0.52	1hr
HC13	0.0818	52.352	30.7	34	22.3	16.5	34	0.65	1hr
HC130	0.1389	88.896	47.1	51.6	31	21.3	51.6	0.58	1hr
HC131	0.1389	88.896	46.9	51.4	31	21.2	51.4	0.58	1hr
HC132	0.9138	584.832	43.2	48.5	28.6	27.6	48.5	0.08	1hr
HC133	0.9417	602.688	43.2	48.2	28.4	28	48.2	0.08	1hr
HC134	1.2551	803.264	30.7	38.3	37.8	39.8	39.8	0.05	6hr
HC135	1.2678	811.392	31.8	39.6	38.6	40.6	40.6	0.05	6hr
HC137	0.1197	76.608	26	29.6	20	14.1	29.6	0.39	1hr
HC138	0.1094	70.016	25.1	28.6	18.9	13.3	28.6	0.41	1hr
HC139	0.0347	22.208	12	13.7	9	6.3	13.7	0.62	1hr
HC14	0.0586	37.504	19.8	21.9	14.2	11	21.9	0.58	1hr
HC140	0.7124	455.936	215.7	246.2	171.3	124.5	246.2	0.54	1hr
HC141	0.7781	497.984	217.7	248.5	173.9	126.8	248.5	0.50	1hr
HC142	0.0657	42.048	3.4	3.7	2.9	3	3.7	0.09	1hr
HC143	0.826	528.64	226.9	259.1	182.1	133.2	259.1	0.49	1hr
HC144	0.8822	564.608	227	259.7	183.3	134.9	259.7	0.46	1hr
HC146	1.2759	816.576	32.9	40.9	39.5	41.3	41.3	0.05	6hr
HC147	0.0642	41.088	44.3	48.6	30	20.6	48.6	1.18	1hr
HC148	0.0523	33.472	42.3	46.2	28	19	46.2	1.38	1hr
HC149	0.0753	48.192	46.3	51	31.8	22	51	1.06	1hr
HC15	0.0157	10.048	2.7	3	1.9	1.4	3	0.30	1hr
HC150	0.0887	56.768	48.3	53.6	33.9	23.5	53.6	0.94	1hr
HC151	0.141	90.24	58.3	64.8	42.7	29.8	64.8	0.72	1hr
HC152	0.1757	112.448	64.1	71.6	47.4	33.3	71.6	0.64	1hr
HC153	0.2237	143.168	68.4	76.7	54	38.3	76.7	0.54	1hr
HC154	0.2094	134.016	69.1	77.1	51.9	36.6	77.1	0.58	1hr
HC155	0.2237	143.168	67.5	75.9	53.7	38.3	75.9	0.53	1hr

			Existing Peak Discharge				Peak Flow		
Element ID	Area	Area	10yr 30min	10yr 1hr	10yr 3hr	10yr 6hr	Existing	Existing/acre	Peak Storm
	mi^2	acres	cfs	cfs	cfs	cfs	cfs	cfs/ac	
HC156	0.2356	150.784	68.8	77.5	55	39.5	77.5	0.51	1hr
HC157	0.2632	168.448	71.5	81.2	59	42.6	81.2	0.48	1hr
HC158	0.1772	113.408	55.2	61.7	51.4	37.8	61.7	0.54	1hr
HC159	0.111	71.04	27.2	37.5	30.3	22.1	37.5	0.53	1hr
HC16	0.0186	11.904	6.3	6.9	4.1	3.1	6.9	0.58	1hr
HC160	0.0573	36.672	12	13.6	9.1	6.4	13.6	0.37	1hr
HC161	0.1092	69.888	22.7	25.9	17.5	12.3	25.9	0.37	1hr
HC162	0.1294	82.816	26	29.8	20.1	14.2	29.8	0.36	1hr
HC163	0.1476	94.464	27.3	31.2	21.2	15	31.2	0.33	1hr
HC166	0.1638	104.832	30.6	35	23.8	16.9	35	0.33	1hr
HC167	0.0479	30.656	5.9	6.7	4.5	3.2	6.7	0.22	1hr
HC168	0.0715	45.76	7.7	9.4	6.8	5.2	9.4	0.21	1hr
HC169	0.0888	56.832	10.8	13	9.3	7	13	0.23	1hr
HC17	0.034	21.76	14.7	15.7	9.8	7.1	15.7	0.72	1hr
HC170	0.098	62.72	11.3	13.4	9.7	7.4	13.4	0.21	1hr
HC171	0.1605	102.72	25.6	29.3	20.7	15.2	29.3	0.29	1hr
HC172	0.1851	118.464	30.3	34.7	24.6	18.4	34.7	0.29	1hr
HC173	0.2112	135.168	33.2	38	27.3	20.3	38	0.28	1hr
HC174	0.2325	148.8	39	44.6	32.2	23.9	44.6	0.30	1hr
HC175	0.075	48	8.5	9.6	6.9	5.1	9.6	0.20	1hr
HC176	0.096	61.44	10.1	11.5	8.3	6.1	11.5	0.19	1hr
HC177	0.1215	77.76	14.3	16.3	11.7	8.6	16.3	0.21	1hr
HC178	0.07	44.8	13.4	15.1	9.9	7.4	15.1	0.34	1hr
HC179	0.0244	15.616	4.7	5.3	3.7	2.6	5.3	0.34	1hr
HC18	0.2193	140.352	66.5	80.2	66.3	50.8	80.2	0.57	1hr
HC180	0.0326	20.864	6.7	7.6	5.3	3.8	7.6	0.36	1hr
HC181	0.0459	29.376	9.6	11	7.6	5.5	11	0.37	1hr
HC182	0.1202	76.928	22.3	25.2	17.7	13.2	25.2	0.33	1hr
HC183	0.1202	76.928	22.3	25.2	17.6	13.2	25.2	0.33	1hr
HC184	0.0274	17.536	6.1	6.9	4.8	3.4	6.9	0.39	1hr
HC185	0.0486	31.104	10.8	12.4	8.4	5.9	12.4	0.40	1hr
HC186	0.0486	31.104	10.8	12.3	8.4	5.9	12.3	0.40	1hr
HC187	0.0313	20.032	5.6	5.7	4.1	3	5.7	0.28	1hr
HC188	0.0179	11.456	2.8	3.2	2.3	1.6	3.2	0.28	1hr
HC189	0.0771	49.344	38.9	41.6	25	17.6	41.6	0.84	1hr
HC19	0.2174	139.136	66	79.5	65.5	50.1	79.5	0.57	1hr
HC190	0.052	33.28	26	28.4	18.3	14	28.4	0.85	1hr
HC191	0.1626	104.064	84.9	96.5	65.6	48.4	96.5	0.93	1hr
HC192	0.0527	33.728	42.5	46.8	28.2	19.4	46.8	1.39	1hr
HC193	0.0368	23.552	22.9	24	14.2	9.7	24	1.02	1hr
HC194	0.0254	16.256	15.5	17.4	11.2	7.7	17.4	1.07	1hr
HC195	0.0381	24.384	18.2	20.6	13.4	9.4	20.6	0.84	1hr
HC196	0.0414	26.496	21.3	24.7	20.2	15.6	24.7	0.93	1hr
HC197	0.0414	26.496	20.6	24.1	19.8	15.4	24.1	0.91	1hr
HC198	0.0625	40	26.8	31.3	26.3	21.1	31.3	0.78	1hr
HC199	0.0917	58.688	34.9	40.5	33.7	26.8	40.5	0.69	1hr
HC2	0.0818	52.352	26.2	27.2	16.9	12.3	27.2	0.52	1hr
HC20	0.1978	126.592	60.1	70.8	55.8	42.5	70.8	0.56	1hr
HC201	0.0615	39.36	33.4	37.9	24.3	17.3	37.9	0.96	1hr
HC202	0.0798	51.072	38.8	44	29.1	21	44	0.86	1hr
HC203	0.0815	52.16	39.5	44.8	29.7	21.5	44.8	0.86	1hr
HC204	0.107	68.48	37.2	42	31.7	24.5	42	0.61	1hr
HC205	0.132	84.48	41.8	47.9	37	28.5	47.9	0.57	1hr
HC206	0.2066	132.224	76	90.8	71.5	57.8	90.8	0.69	1hr
HC207	0	0	0	0	0	0	0		
HC208	0.0455	29.12	18.8	21.6	14.6	11.8	21.6	0.74	1hr
HC209	0.06823	43.6672	40	36.4	21	16.6	40	0.92	30min

			Existing Peak Discharge				Peak Flow		
Element ID	Area	Area	10yr 30min	10yr 1hr	10yr 3hr	10yr 6hr	Existing	Existing/acre	Peak Storm
	mi^2	acres	cfs	cfs	cfs	cfs	cfs	cfs/ac	
HC21	0.1887	120.768	60.3	70.7	54.5	41	70.7	0.59	1hr
HC210	0.0347	22.208	11.9	13.6	8.8	6.1	13.6	0.61	1hr
HC211	0.0608	38.912	17.8	20.2	13.4	9.3	20.2	0.52	1hr
HC212	0.08497	54.3808	32.4	26.5	14.8	11.7	32.4	0.60	30min
HC215	0.1119	71.616	53.1	57.6	35.8	25.1	57.6	0.80	1hr
HC216	0.054	34.56	17.6	17.5	10.7	8.1	17.6	0.51	30min
HC217	0.0161	10.304	3	2.6	1.3	0.9	3	0.29	30min
HC218	0.1778	113.792	46.5	51.4	31.1	21.5	51.4	0.45	1hr
HC219	0.1944	124.416	6.3	6.3	6.3	6.6	6.6	0.05	6hr
HC22	0.1514	96.896	50	58	43.6	32.2	58	0.60	1hr
HC220	0.2198	140.672	8.8	9.4	8.5	9.1	9.4	0.07	1hr
HC221	0.0094	6.016	2.1	2.4	2.1	1.9	2.4	0.40	1hr
HC222	0.0321	20.544	4.2	5.2	4.9	4.7	5.2	0.25	1hr
HC223	0.3572	228.608	95.6	111.1	80.5	58.7	111.1	0.49	1hr
HC224	0.021	13.44	6.5	6.8	4.3	3.3	6.8	0.51	1hr
HC225	0.0432	27.648	14	16.1	12.1	10.1	16.1	0.58	1hr
HC226	0.0283	18.112	7.9	8.3	4.9	4	8.3	0.46	1hr
HC23	0.0286	18.304	10.5	12.1	7.9	5.5	12.1	0.66	1hr
HC24	0.311759	199.5258	77	87.4	60.9	45.6	87.4	0.44	1hr
HC25	0.0364	23.296	30.4	33.6	21	14.3	33.6	1.44	1hr
HC26	0.1372	87.808	43.9	50.5	36.4	26.7	50.5	0.58	1hr
HC27	0.672759	430.5658	202.1	237.7	181.7	137.4	237.7	0.55	1hr
HC28	0.0445	28.48	10.1	11.4	7.6	5.4	11.4	0.40	1hr
HC29	0.1472	94.208	105.8	104.7	60.6	42.8	105.8	1.12	30min
HC3	0.1239	79.296	45.4	45.8	27.7	21.1	45.8	0.58	1hr
HC30	0.0366	23.424	13.1	12.7	6.5	4.4	13.1	0.56	30min
HC31	0.0477	30.528	15.6	15.3	8.1	5.5	15.6	0.51	30min
HC32	0.1419	90.816	35	37.5	25.5	21.3	37.5	0.41	1hr
HC34	0.1648	105.472	40.2	44.8	30.8	26.1	44.8	0.42	1hr
HC35	0.0794	50.816	19.6	23.6	18.1	13.5	23.6	0.46	1hr
HC36	0.0248	15.872	7.6	7.4	4.7	3.9	7.6	0.48	30min
HC37	0.2525	161.6	53.4	63.3	49.5	40	63.3	0.39	1hr
HC38	0.2852	182.528	59.6	71	55.9	44.8	71	0.39	1hr
HC39	0.3362	215.168	113.6	121.2	87.3	67	121.2	0.56	1hr
HC4	0.156759	100.3258	48.3	51.2	32.2	24.4	51.2	0.51	1hr
HC40	0.4675	299.2	212.1	229.1	158.1	118.5	229.1	0.77	1hr
HC41	0.0654	41.856	38.4	42.7	29.6	22.5	42.7	1.02	1hr
HC42	0.0841	53.824	55.9	60	41.1	30.9	60	1.11	1hr
HC43	0.4902	313.728	221	241.9	169.1	126.1	241.9	0.77	1hr
HC44	0.5057	323.648	215.3	238.9	170	126.8	238.9	0.74	1hr
HC45	0.5248	335.872	220.4	248	178	133.6	248	0.74	1hr
HC46	0.5959	381.376	236.3	266.3	190.5	143	266.3	0.70	1hr
HC47	0.6089	389.696	236.5	267.9	193.3	145.1	267.9	0.69	1hr
HC48	0.6423	411.072	243.4	276.5	200.9	150.7	276.5	0.67	1hr
HC49	0.659	421.76	241.8	275.8	202.2	152.2	275.8	0.65	1hr
HC5	0.179759	115.0458	52	56.3	36.5	27.4	56.3	0.49	1hr
HC50	0.0512	32.768	16.8	17.6	10.2	7	17.6	0.54	1hr
HC51	0.055	35.2	69.1	62.4	33.7	22.7	69.1	1.96	30min
HC52	0.0797	51.008	86.5	79.6	43.1	29.3	86.5	1.70	30min
HC53	0.1261	80.704	90.5	86.2	49.4	34.8	90.5	1.12	30min
HC54	0.032	20.48	6.2	7.1	4.8	3.4	7.1	0.35	1hr
HC55	0.1792	114.688	108.6	109.8	65.1	46.1	109.8	0.96	1hr
HC56	0.8828	564.992	311.4	364	271.3	205	364	0.64	1hr
HC57	0.6809	435.776	244.1	281	208.3	157.9	281	0.64	1hr
HC58	0.0299	19.136	4.4	5.2	5.2	5	5.2	0.27	1hr
HC59	0.0628	40.192	8.3	9.7	8.4	7.7	9.7	0.24	1hr
HC6	0.0209	13.376	5.4	5.7	3.2	2.2	5.7	0.43	1hr

			Existing Peak Discharge				Peak Flow		
Element ID	Area	Area	10yr 30min	10yr 1hr	10yr 3hr	10yr 6hr	Existing	Existing/acre	Peak Storm
	mi^2	acres	cfs	cfs	cfs	cfs	cfs	cfs/ac	
HC60	0.1002	64.128	28.9	32.5	24	19	32.5	0.51	1hr
HC61	0.2612	167.168	65.3	71.2	52.1	43.4	71.2	0.43	1hr
HC62	0.0043	2.752	0.4	0.5	0.4	0.4	0.5	0.18	1hr
HC63	0.0788	50.432	26.1	25	14.6	12.7	26.1	0.52	30min
HC64	0.0365	23.36	6.8	6.4	6.1	6.1	6.8	0.29	30min
HC65	0.1485	95.04	37.2	37.7	25.8	22.5	37.7	0.40	1hr
HC66	0.0515	32.96	6.9	8.8	8.6	8.4	8.8	0.27	1hr
HC67	0.0714	45.696	15.2	17	14.5	13.4	17	0.37	1hr
HC68	0.0564	36.096	18	18.1	9.8	6.7	18.1	0.50	1hr
HC69	0.0362	23.168	11.8	13.5	10.7	9.2	13.5	0.58	1hr
HC7	0.212159	135.7818	59	64.5	42.1	31.5	64.5	0.48	1hr
HC70	0.035	22.4	57.6	45.8	21.3	14.1	57.6	2.57	30min
HC71	0.0334	21.376	6.9	8.4	7.4	5.7	8.4	0.39	1hr
HC72	0.0501	32.064	7.6	9.7	9.2	7.5	9.7	0.30	1hr
HC73	0.2823	180.672	70.3	79.3	59	48.9	79.3	0.44	1hr
HC74	1.1834	757.376	77.2	87.9	68.4	58.6	87.9	0.12	1hr
HC75	0.0396	25.344	16.5	18.3	11.1	7.7	18.3	0.72	1hr
HC76	1.2107	774.848	21.1	23.4	25.5	27.6	27.6	0.04	6hr
HC77	1.334	853.76	62.8	70.6	56.5	50.5	70.6	0.08	1hr
HC79	1.347	862.08	62.5	70.5	57.5	51.7	70.5	0.08	1hr
HC8	0.240259	153.7658	61.1	67.7	45.3	34	67.7	0.44	1hr
HC80	1.354	866.56	61	69.3	57.6	52	69.3	0.08	1hr
HC81	1.4088	901.632	64.4	73.2	62.3	57.5	73.2	0.08	1hr
HC82	1.4532	930.048	71	81.1	69.2	63.1	81.1	0.09	1hr
HC83	0.1947	124.608	41.9	47.8	33.7	24	47.8	0.38	1hr
HC84	1.4324	916.736	69.5	79.1	66.5	60.5	79.1	0.09	1hr
HC85	1.7604	1126.656	126.4	147.6	123.7	104.1	147.6	0.13	1hr
HC86	1.8568	1188.352	143.1	175	160.2	133.1	175	0.15	1hr
HC87	1.9064	1220.096	154.9	190.4	173.7	143.7	190.4	0.16	1hr
HC88	1.8901	1209.664	153.7	188.7	172	142.5	188.7	0.16	1hr
HC89	0.1624	103.936	35.1	39.9	27.6	19.4	39.9	0.38	1hr
HC9	0.0542	34.688	11.7	13	9	6.9	13	0.37	1hr
HC90	0.1516	97.024	32.9	37.5	25.7	18.1	37.5	0.39	1hr
HC91	0.1048	67.072	23.4	26.5	17.9	12.5	26.5	0.40	1hr
HC92	0.0257	16.448	3.1	3.5	3.6	3.7	3.7	0.22	6hr
HC93	1.2702	812.928	29.8	33.6	32.3	32.5	33.6	0.04	1hr
HC94	0.0397	25.408	9.7	12.2	9.7	8.1	12.2	0.48	1hr
HC95	0.0146	9.344	3.3	3.8	2.6	2	3.8	0.41	1hr
HC96	0.216	138.24	44.5	50.8	36.6	26.2	50.8	0.37	1hr
HC97	0.4747	303.808	148.7	175.5	124.3	89.3	175.5	0.58	1hr
HC98	0.5273	337.472	155.7	186.9	136.8	100.3	186.9	0.55	1hr
HC99	0.6359	406.976	197.1	241.4	174.2	126.7	241.4	0.59	1hr
Irr	0.02172	13.9008	7.4	8.6	5.4	3.9	8.6	0.62	1hr
Junction-1Ea	1.2678	811.392	31.8	39.6	38.6	40.6	40.6	0.05	6hr
Junction-1Sc	0.0471	30.144	14.1	15.8	9	6.4	15.8	0.52	1hr
Junction-10	0.3331	213.184	94.3	110	78.1	55.9	110	0.52	1hr
Junction-11	0.3331	213.184	93.4	109.1	77.8	55.8	109.1	0.51	1hr
Junction-12	0.3685	235.84	104.5	121.5	87.9	63.9	121.5	0.52	1hr
Junction-13	0.0107	6.848	1.3	1.5	1.1	0.8	1.5	0.22	1hr
Junction-14	0.0107	6.848	1.3	1.5	1.1	0.8	1.5	0.22	1hr
Junction-15	0.0107	6.848	1.3	1.4	1.1	0.8	1.4	0.20	1hr
Junction-16	0.4668	298.752	147.2	171.3	124.6	91.7	171.3	0.57	1hr
Junction-17	0.205	131.2	68	74.4	44.1	30.1	74.4	0.57	1hr
Junction-18	0.0067	4.288	1.1	1.2	0.9	0.7	1.2	0.28	1hr
Junction-19	0.826	528.64	224.8	257	181.3	133	257	0.49	1hr
Junction-2	0.713	456.32	211.6	259.3	187.3	136.5	259.3	0.57	1hr
Junction-20	0.826	528.64	223.9	256.3	180.8	132.9	256.3	0.48	1hr

			Existing Peak Discharge				Peak Flow		
Element ID	Area	Area	10yr 30min	10yr 1hr	10yr 3hr	10yr 6hr	Existing	Existing/acre	Peak Storm
	mi^2	acres	cfs	cfs	cfs	cfs	cfs	cfs/ac	
Junction-21	0	0	0	0	0	0	0		
Junction-22	0.0252	16.128	12.4	14.4	10	8.6	14.4	0.89	1hr
Junction-23	0.0252	16.128	12.4	14.3	9.9	8.5	14.3	0.89	1hr
Junction-24	0.0815	52.16	37.7	42.4	29.4	21.5	42.4	0.81	1hr
Junction-25	0.0888	56.832	10.7	12.8	9.3	7	12.8	0.23	1hr
Junction-26	0.098	62.72	11.2	13.4	9.7	7.4	13.4	0.21	1hr
Junction-27	0.098	62.72	11.2	13.4	9.7	7.4	13.4	0.21	1hr
Junction-28	0.1605	102.72	25.3	29	20.6	15.2	29	0.28	1hr
Junction-29	0.0162	10.368	3.6	4.1	2.8	2	4.1	0.40	1hr
Junction-3	1.06	678.4	42.1	49.6	53.2	55	55	0.08	6hr
Junction-30	0.07	44.8	13.3	14.9	9.8	7.4	14.9	0.33	1hr
Junction-32	0.0396	25.344	15.8	17.7	11	7.6	17.7	0.70	1hr
Junction-33	0.0059	3.776	2.1	2.4	1.5	1.1	2.4	0.64	1hr
Junction-34	0.015	9.6	1.8	2.2	2	1.6	2.2	0.23	1hr
Junction-35	0.0299	19.136	4.3	5.2	5.2	5	5.2	0.27	1hr
Junction-36	0.0628	40.192	8.3	9.6	8.4	7.7	9.6	0.24	1hr
Junction-38	0.1624	103.936	35	39.8	27.5	19.4	39.8	0.38	1hr
Junction-39	1.6692	1068.288	113.8	130.6	105.5	88.9	130.6	0.12	1hr
Junction-4	0.1362	87.168	20.1	26.1	24.3	18.8	26.1	0.30	1hr
Junction-5	0.7572	484.608	8.8	9.9	11.2	12.6	12.6	0.03	6hr
Junction-7	0.0369	23.616	19.5	23.9	15.5	10.7	23.9	1.01	1hr
Junction-8	0.1239	79.296	45.2	45.7	27.6	21.1	45.7	0.58	1hr
Junction-9	0.0818	52.352	30.3	33.6	22.1	16.5	33.6	0.64	1hr
J1101	1.056284	676.0218	273	312.3	243.2	205.6	312.3	0.46	1hr
J1102	0.954884	611.1258	250.6	282.6	211.9	180.5	282.6	0.46	1hr
J1103	0.751177	480.7533	219.1	246.6	181.7	152.3	246.6	0.51	1hr
J1103b	0.27177	173.9328	103	115.4	77.6	58.1	115.4	0.66	1hr
J1103c	0.536377	343.2813	149.6	168.4	120.4	97	168.4	0.49	1hr
J1104	0.2148	137.472	74.6	83.3	63.4	55.4	83.3	0.61	1hr
J111	0.034	21.76	3.3	3.8	2.8	3.2	3.8	0.17	1hr
J111b	0.0551	35.264	7.6	8.7	6.2	4.8	8.7	0.25	1hr
J114	0.0168	10.752	7.4	8.4	5.4	3.8	8.4	0.78	1hr
J117	0.0245	15.68	1.6	1.8	1.7	2.5	2.5	0.16	6hr
J118	0.0366	23.424	5.1	5.9	4	4	5.9	0.25	1hr
J118b	0.1179	75.456	26.3	30.5	22.3	18.4	30.5	0.40	1hr
J119	0.2653	169.792	28.7	33.8	31.4	32.4	33.8	0.20	1hr
J119b	0.29166	186.6624	35.6	41.3	36.6	36.6	41.3	0.22	1hr
J120	0.35026	224.1664	46.4	54.5	47.4	44.3	54.5	0.24	1hr
J1201	0.2001	128.064	66	73.5	57.6	50.8	73.5	0.57	1hr
J1202	0.0908	58.112	52.2	57.9	36.7	26	57.9	1.00	1hr
J1202b	0.15937	101.9968	51.3	54.6	34.4	27.5	54.6	0.54	1hr
J1202c	0.0908	58.112	51.3	57.3	36.6	25.9	57.3	0.99	1hr
J1203	0.0331	21.184	22.9	25.3	15.6	10.9	25.3	1.19	1hr
J1205	0.1646	105.344	40.5	45.7	44.4	39.8	45.7	0.43	1hr
J122	1.103684	706.3578	270.8	312	239.9	201.4	312	0.44	1hr
J123	1.153384	738.1658	252.2	293.9	242.7	206.8	293.9	0.40	1hr
J13	0.2852	182.528	59.5	70.9	55.9	44.7	70.9	0.39	1hr
J1301	0.1153	73.792	28.8	36.9	34.9	30.3	36.9	0.50	1hr
J1302	0.0503	32.192	25.5	29.1	22.7	16.3	29.1	0.90	1hr
J1302b	0.0503	32.192	24.5	28.1	22.4	16.3	28.1	0.87	1hr
J1305	0.0274	17.536	7.8	9.2	6.6	6.1	9.2	0.52	1hr
J1305b	0.117899	75.45536	60.5	67.7	47.5	33.9	67.7	0.90	1hr
J1311	0.117899	75.45536	64.6	72.4	48.1	34.2	72.4	0.96	1hr
J1311b	0.057468	36.77952	49.7	55.4	35.2	24.4	55.4	1.51	1hr
J1401	0.02636	16.8704	8.1	9.2	6.1	4.8	9.2	0.55	1hr
J1403	0.1179	75.456	26.4	30.6	22.4	18.5	30.6	0.41	1hr
J1501	0.0284	18.176	5.1	5.9	4.7	4	5.9	0.32	1hr

			Existing Peak Discharge				Peak Flow		
Element ID	Area	Area	10yr 30min	10yr 1hr	10yr 3hr	10yr 6hr	Existing	Existing/acre	Peak Storm
	mi^2	acres	cfs	cfs	cfs	cfs	cfs	cfs/ac	
J1502	0.0321	20.544	6.7	7.8	5.4	4.5	7.8	0.38	1hr
J1503	0.0503	32.192	27.5	31.2	23.1	16.5	31.2	0.97	1hr
J1505	0.1647	105.408	25.1	28	23.5	20.8	28	0.27	1hr
J1505b	0.1647	105.408	25.1	27.9	23.4	20.8	27.9	0.26	1hr
J1507	0	0	0	0	0	0	0		
J1507b	0.105	67.2	29.7	33.4	21.2	15.2	33.4	0.50	1hr
J1512	0.076	48.64	18.9	21.2	14.1	10.4	21.2	0.44	1hr
J1512b	0	0	0	0	0	0	0		
J1513	0.0593	37.952	20.6	23.1	14.8	10.3	23.1	0.61	1hr
J1513b	0.0593	37.952	21.3	24	14.9	10.4	24	0.63	1hr
J1514	0.047668	30.50752	42.2	46.8	29.2	20.2	46.8	1.53	1hr
J1515	0.0045	2.88	2.8	3.1	2.2	1.7	3.1	1.08	1hr
J160	0.0113	7.232	3.1	3.5	2.4	2	3.5	0.48	1hr
J1601	0.1179	75.456	26.6	30.9	22.5	18.5	30.9	0.41	1hr
J1602	0.076	48.64	18.4	20.7	14.1	10.4	20.7	0.43	1hr
J1604	0.0189	12.096	4.7	5.5	3.7	3.1	5.5	0.45	1hr
J1605	0.0184	11.776	7.4	8.6	5.6	4.6	8.6	0.73	1hr
J1606	0.0503	32.192	29.8	33.8	23.6	16.6	33.8	1.05	1hr
J1606b	0.0381	24.384	22.7	25.7	18.3	12.9	25.7	1.05	1hr
J1607	0.0296	18.944	21	23.7	14.7	10.1	23.7	1.25	1hr
J1610	0.0085	5.44	5.6	6.4	4.2	2.9	6.4	1.18	1hr
J1701	0.067	42.88	17.4	19.4	12.7	9.4	19.4	0.45	1hr
J1702	0.017	10.88	4	4.6	3.1	2.3	4.6	0.42	1hr
J203	0.0226	14.464	4.4	5.2	3.7	4.2	5.2	0.36	1hr
J2104	0.0754	48.256	29.7	33.2	21.6	17.2	33.2	0.69	1hr
J227	0.0621	39.744	9.3	10.5	7.3	7.3	10.5	0.26	1hr
J228	0.0367	23.488	6.6	7.5	5.1	4.1	7.5	0.32	1hr
J233	0.0058	3.712	0.4	0.4	0.3	0.4	0.4	0.11	30min
J234	0.0679	43.456	9.6	10.8	7.6	7.6	10.8	0.25	1hr
J261	0.2073	132.672	22.3	25.4	24.6	25.4	25.4	0.19	1hr
J261b	0.1889	120.896	32	38.6	30.5	26.3	38.6	0.32	1hr
J281	0.0237	15.168	12	14.4	11.5	8.6	14.4	0.95	1hr
J3101	0.0715	45.76	49.6	54.4	33.7	26.7	54.4	1.19	1hr
J3105	0.0438	28.032	45.6	49.2	28.8	20	49.2	1.76	1hr
J3203	0.0428	27.392	38.5	42.7	26.5	18.7	42.7	1.56	1hr
J3204	0.0081	5.184	6.7	7.6	4.9	3.5	7.6	1.47	1hr
J3205	0.0311	19.904	22	24.3	15.9	11.7	24.3	1.22	1hr
J325	0.0209	13.376	4	4.6	3.3	2.4	4.6	0.34	1hr
J325b	0.052	33.28	17.1	19.6	12.8	9	19.6	0.59	1hr
J328	0.0386	24.704	14.3	16.3	10.4	7.2	16.3	0.66	1hr
J372	0.1339	85.696	20.8	24	17	14.3	24	0.28	1hr
J376	0.0141	9.024	2.5	2.8	2	1.8	2.8	0.31	1hr
J38	0.0697	44.608	14.4	14.2	11.5	9.9	14.4	0.32	30min
J409	0.017	10.88	1.7	1.9	2.1	2.2	2.2	0.20	6hr
J419	0.007	4.48	6.4	7.4	4.8	3.3	7.4	1.65	1hr
J421	0.0302	19.328	27.1	30.6	19.1	13.1	30.6	1.58	1hr
J421b	0.2536	162.304	114.5	128.9	95.8	74.3	128.9	0.79	1hr
J467	0.0298	19.072	6.9	7.8	5.1	3.6	7.8	0.41	1hr
J472	0.1215	77.76	14.3	16.3	11.6	8.6	16.3	0.21	1hr
J490	0.0432	27.648	13.9	16	12.1	10.1	16	0.58	1hr
J494	0.0075	4.8	0.6	0.8	0.8	1.1	1.1	0.23	6hr
J497	0.0744	47.616	12.1	14	10.1	11.4	14	0.29	1hr
J515	1.9064	1220.096	154.8	190.3	173.5	143.6	190.3	0.16	1hr
J531	0.0884	56.576	23.3	29.1	24.2	22.8	29.1	0.51	1hr
J532	0.0047	3.008	4	4.6	3.1	2.2	4.6	1.53	1hr
J540	0.1395	89.28	62.4	73.2	59.2	46.7	73.2	0.82	1hr
J541	0.0433	27.712	38.2	42	24.9	16.8	42	1.52	1hr

			Existing Peak Discharge				Peak Flow		
Element ID	Area	Area	10yr 30min	10yr 1hr	10yr 3hr	10yr 6hr	Existing	Existing/acre	Peak Storm
	mi^2	acres	cfs	cfs	cfs	cfs	cfs	cfs/ac	
J545	0.0211	13.504	5.2	5.3	3.3	2.3	5.3	0.39	1hr
J548	0.1166	74.624	51.4	60.1	48	37.4	60.1	0.81	1hr
J573	0.0652	41.728	16.9	18.7	12.1	8.4	18.7	0.45	1hr
J573b	0.0652	41.728	18.9	20.8	12.3	8.5	20.8	0.50	1hr
J580	1.2759	816.576	32.8	40.8	39.5	41.3	41.3	0.05	6hr
J580b	1.2759	816.576	32.9	40.9	39.5	41.3	41.3	0.05	6hr
J584	0.0357	22.848	8	8.9	6.9	5.6	8.9	0.39	1hr
J585	0.0433	27.712	36.4	40	24.7	16.8	40	1.44	1hr
J586	0.1197	76.608	25.8	29.3	19.9	14.1	29.3	0.38	1hr
J589	0	0	0	0	0	0	0		
J594	0.302	193.28	28.4	39.8	47.1	51.8	51.8	0.27	6hr
J624	0.1086	69.504	33.8	38.9	28.7	21.3	38.9	0.56	1hr
J644	0.0234	14.976	6.3	7.4	5.6	4	7.4	0.49	1hr
J654	0.0098	6.272	4.3	5.1	4.1	3.1	5.1	0.81	1hr
J655	0.0237	15.168	12	14.4	11.6	8.6	14.4	0.95	1hr
J656	0.0163	10.432	7.7	9.3	7.5	5.6	9.3	0.89	1hr
J660	0.0537	34.368	16.2	15.4	9.8	9.1	16.2	0.47	30min
J668	0.0743	47.552	13.1	14.8	10.2	7.9	14.8	0.31	1hr
J92	0.0271	17.344	4.4	5	3.5	2.5	5	0.29	1hr
NorthFlow	0.08598	55.0272	30.9	35.5	23	19.5	35.5	0.65	1hr
NW	0	0	0	0	0	0	0		
Outlet	0.0364	23.296	29.8	33.2	20.8	14.2	33.2	1.43	1hr
SBT1101	0.0285	18.24	22.9	24.8	14.5	9.9	24.8	1.36	1hr
SBT1101b	0.04435	28.384	38.2	40.4	22.9	15.4	40.4	1.42	1hr
SBT1102a	0.015379	9.84256	7.3	8.4	5.3	3.7	8.4	0.85	1hr
SBT1102b	0.011334	7.25376	2.6	3	2.2	1.9	3	0.41	1hr
SBT1102c	0.029993	19.19552	5	5.8	3.9	3.1	5.8	0.30	1hr
SBT1102d	0.040099	25.66336	10.5	12	8	8.5	12	0.47	1hr
SBT1102e	0.018848	12.06272	5.9	6.8	4.4	3.2	6.8	0.56	1hr
SBT1102f	0.008995	5.7568	4.1	4.8	3.2	2.3	4.8	0.83	1hr
SBT1102g	0.059959	38.37376	10.5	11.9	7.6	7.6	11.9	0.31	1hr
SBT1103a	0.191692	122.6829	60	62.3	34.8	30.1	62.3	0.51	1hr
SBT1103b	0.030915	19.7856	6.2	7.1	4.6	3.2	7.1	0.36	1hr
SBT1202	0.13197	84.4608	50.6	52.6	29.6	22.1	52.6	0.62	1hr
SBT1513	0.012073	7.72672	11	12.3	7.6	5.2	12.3	1.59	1hr
SBT1514	0.019195	12.2848	18.6	20.5	12.1	8.2	20.5	1.67	1hr
SB1	0.0229	14.656	5.5	7.5	6.5	5.8	7.5	0.51	1hr
SB10	0.0067	4.288	2.3	2.2	1.1	1	2.3	0.54	30min
SB100	0.0234	14.976	5.2	6	3.9	2.8	6	0.40	1hr
SB101	0.019	12.16	3.9	4.5	3	2.1	4.5	0.37	1hr
SB102	0.0097	6.208	1.6	1.8	1.3	1	1.8	0.29	1hr
SB103	0.0143	9.152	3.4	3.9	2.7	1.9	3.9	0.43	1hr
SB104	0.0119	7.616	2.2	2.5	1.8	1.3	2.5	0.33	1hr
SB105	0.0158	10.112	3	3.4	2.4	1.7	3.4	0.34	1hr
SB106	0.0149	9.536	4	4.6	3.1	2.2	4.6	0.48	1hr
SB107	0.0106	6.784	1.8	2	1.5	1.1	2	0.29	1hr
SB107b	0.0054	3.456	0.8	0.9	0.7	0.5	0.9	0.26	1hr
SB108	0.0111	7.104	2.4	2.8	2	1.4	2.8	0.39	1hr
SB109	0.0382	24.448	1.5	1.8	2.5	3.8	3.8	0.16	6hr
SB11	0.0083	5.312	1.6	1.7	0.9	0.6	1.7	0.32	1hr
SB110	0.0579	37.056	11.4	12.9	8	6.2	12.9	0.35	1hr
SB1101	0.0393	25.152	27.8	29.9	17.3	11.8	29.9	1.19	1hr
SB1102	0.0336	21.504	11.3	12.9	8.3	7.7	12.9	0.60	1hr
SB1103	0.042	26.88	34.6	36.9	21.1	14.5	36.9	1.37	1hr
SB1104	0.0147	9.408	9.6	10.8	6.8	4.9	10.8	1.15	1hr
SB111	0.0197	12.608	2.1	2.4	1.8	1.9	2.4	0.19	1hr
SB112	0.0163	10.432	17	18.8	11.2	7.6	18.8	1.80	1hr

			Existing Peak Discharge				Peak Flow		
Element ID	Area	Area	10yr 30min	10yr 1hr	10yr 3hr	10yr 6hr	Existing	Existing/acre	Peak Storm
	mi^2	acres	cfs	cfs	cfs	cfs	cfs	cfs/ac	
SB113	0.0271	17.344	30.7	33	18.9	12.6	33	1.90	1hr
SB114	0.0168	10.752	7.4	8.4	5.4	3.8	8.4	0.78	1hr
SB115	0.0339	21.696	6.5	7.5	4.9	4	7.5	0.35	1hr
SB116	0.0297	19.008	1.1	1.4	2	2.9	2.9	0.15	6hr
SB117	0.0245	15.68	1.6	1.8	1.7	2.5	2.5	0.16	6hr
SB118	0.0366	23.424	5.1	5.9	4	4	5.9	0.25	1hr
SB119	0.0214	13.696	8.5	9.7	6.1	4.4	9.7	0.71	1hr
SB12	0.014	8.96	22.9	20.3	9.9	6.5	22.9	2.56	30min
SB120	0.0184	11.776	10.4	11.7	7.3	5.1	11.7	0.99	1hr
SB1201	0.0355	22.72	31.8	34.2	19.6	13.2	34.2	1.51	1hr
SB1202	0.0216	13.824	10.4	11.7	7.3	5.1	11.7	0.85	1hr
SB1203	0.035	22.4	22	24	14.1	9.9	24	1.07	1hr
SB1204	0.0227	14.528	10.8	12.1	7.5	5.2	12.1	0.83	1hr
SB1205	0.0493	31.552	21.9	23.9	14.1	10.2	23.9	0.76	1hr
SB121	0.0402	25.728	8.9	10.1	6.3	4.8	10.1	0.39	1hr
SB122	0.0172	11.008	7	8.1	5.8	5.5	8.1	0.74	1hr
SB124	0.0218	13.952	12.1	13.6	8.3	5.7	13.6	0.97	1hr
SB125	0.0153	9.792	0.7	1.1	1.8	2.4	2.4	0.25	6hr
SB126	0.0287	18.368	8.7	9.9	6.5	5.9	9.9	0.54	1hr
SB127	0.0031	1.984	0.6	0.7	0.6	0.6	0.7	0.35	1hr
SB128	0.0072	4.608	1.7	2	1.4	1.1	2	0.43	1hr
SB129	0.0208	13.312	2.7	3.1	2.2	2.3	3.1	0.23	1hr
SB13	0.0165	10.56	22.3	22.2	11.7	7.7	22.3	2.11	30min
SB130	0.009	5.76	2.2	2.6	1.8	1.4	2.6	0.45	1hr
SB1301	0.0293	18.752	8.1	9.3	6.4	6.9	9.3	0.50	1hr
SB1302	0.0273	17.472	10.7	12.1	7.5	5.7	12.1	0.69	1hr
SB1303	0.0212	13.568	19.2	21.1	12.5	8.5	21.1	1.56	1hr
SB1304	0.0177	11.328	5.1	6	4.4	4.6	6	0.53	1hr
SB1305	0.0097	6.208	2.7	3.1	2.2	1.6	3.1	0.50	1hr
SB1306	0.0153	9.792	1.5	1.7	1.3	1.8	1.8	0.18	6hr
SB1307	0.0332	21.248	11	12.4	7.6	5.3	12.4	0.58	1hr
SB1308	0.025122	16.07808	7.6	8.7	5.5	4	8.7	0.54	1hr
SB1309	0.0084	5.376	2.1	2.4	1.8	1.8	2.4	0.45	1hr
SB131	0.0175	11.2	3.3	3.9	2.8	3.2	3.9	0.35	1hr
SB1310	0.0119	7.616	4.1	4.7	3.2	2.5	4.7	0.62	1hr
SB1311	0.0098	6.272	8.8	10	6.3	4.3	10	1.59	1hr
SB1312	0.011809	7.55776	7	8	5.1	3.5	8	1.06	1hr
SB132	0.0073	4.672	2.7	3.1	2.2	1.6	3.1	0.66	1hr
SB133	0.013	8.32	1.7	1.9	1.4	1.4	1.9	0.23	1hr
SB134	0.0185	11.84	5.2	5.9	3.9	2.8	5.9	0.50	1hr
SB135	0.0125	8	3.3	3.8	2.6	1.9	3.8	0.48	1hr
SB136	0.0143	9.152	1.2	1.4	1.1	1.3	1.4	0.15	1hr
SB137	0.0201	12.864	14.7	16.4	9.9	6.7	16.4	1.27	1hr
SB138	0.0291	18.624	15.2	16.9	10.3	7.8	16.9	0.91	1hr
SB14	0.0149	9.536	25.9	22.1	10.7	7.1	25.9	2.72	30min
SB140	0.021	13.44	5.1	5.8	3.8	2.7	5.8	0.43	1hr
SB1401	0.0362	23.168	16.3	18.2	11.8	11	18.2	0.79	1hr
SB1402	0.0225	14.4	5.5	6.3	4.2	3.4	6.3	0.44	1hr
SB1403	0.0246	15.744	6.7	7.7	5	4.1	7.7	0.49	1hr
SB1404	0.0105	6.72	0.1	0.1	0.2	0.4	0.4	0.06	6hr
SB141	0.0279	17.856	0.3	0.3	0.5	1.1	1.1	0.06	6hr
SB142	0.0111	7.104	2.1	2.4	1.7	1.4	2.4	0.34	1hr
SB143	0.0064	4.096	0.8	0.9	0.6	0.6	0.9	0.22	1hr
SB144	0.0229	14.656	9.2	10.4	6.5	4.5	10.4	0.71	1hr
SB145	0.0101	6.464	9.2	10.3	6.5	4.5	10.3	1.59	1hr
SB146	0.0203	12.992	6.6	7.6	4.9	3.4	7.6	0.58	1hr
SB146A	0.0031	1.984	1.9	1.5	0.7	0.5	1.9	0.96	30min

			Existing Peak Discharge				Peak Flow		
Element ID	Area	Area	10yr 30min	10yr 1hr	10yr 3hr	10yr 6hr	Existing	Existing/acre	Peak Storm
	mi^2	acres	cfs	cfs	cfs	cfs	cfs	cfs/ac	
SB147	0.01364	8.7296	26.2	20.8	9.6	6.3	26.2	3.00	30min
SB147A	0.00179	1.1456	3	2.3	1.1	0.7	3	2.62	30min
SB147B	0.001	0.64	1.4	1.4	0.7	0.5	1.4	2.19	30min
SB148	0.00978	6.2592	14.1	11	5.1	3.4	14.1	2.25	30min
SB149	0.0126	8.064	2.8	3.4	2.5	1.8	3.4	0.42	1hr
SB15	0.0187	11.968	32.5	26.6	12.7	8.5	32.5	2.72	30min
SB150	0.0188	12.032	4.6	5.3	3.5	2.5	5.3	0.44	1hr
SB1501	0.0126	8.064	3.5	4	2.8	2.4	4	0.50	1hr
SB1502	0.0277	17.728	8.5	9.7	6.1	4.4	9.7	0.55	1hr
SB1503	0.0444	28.416	10.5	11.9	7.4	5.8	11.9	0.42	1hr
SB1504	0.0158	10.112	2.6	2.9	2.1	1.7	2.9	0.29	1hr
SB1505	0.0401	25.664	8.4	9.5	6	4.6	9.5	0.37	1hr
SB1506	0.0196	12.544	4.7	5.4	3.6	2.8	5.4	0.43	1hr
SB1507	0.0457	29.248	9.2	10.4	6.6	5	10.4	0.36	1hr
SB1508	0.0235	15.04	9	10.1	6.4	4.5	10.1	0.67	1hr
SB1509	0.0388	24.832	15.1	16.8	10.1	6.9	16.8	0.68	1hr
SB151	0.0183	11.712	23.3	23.8	12.8	8.5	23.8	2.03	1hr
SB1510	0.0016	1.024	0.7	0.7	0.6	0.4	0.7	0.68	30min
SB1511	0.0074	4.736	2.4	2.8	2	1.8	2.8	0.59	1hr
SB1512	0.009	5.76	1.8	2.1	1.5	1.1	2.1	0.36	1hr
SB1513	0.0205	13.12	6.5	7.4	4.8	3.4	7.4	0.56	1hr
SB1514	0.0119	7.616	11.1	12.5	7.7	5.2	12.5	1.64	1hr
SB1515	0.0029	1.856	2.1	2.4	1.7	1.2	2.4	1.29	1hr
SB152	0.0224	14.336	29	29.6	15.7	10.5	29.6	2.06	1hr
SB153	0.0227	14.528	24.9	24.4	12.7	8.4	24.9	1.71	30min
SB154	0.0205	13.12	9.8	9.1	4.6	3.1	9.8	0.75	30min
SB155	0.0122	7.808	3.8	4.4	3	2.1	4.4	0.56	1hr
SB156	0.0164	10.496	15.1	16.7	10.1	6.8	16.7	1.59	1hr
SB157	0.0065	4.16	1.9	2.2	1.6	1.1	2.2	0.53	1hr
SB158	0.0141	9.024	11.4	12.8	8	5.9	12.8	1.42	1hr
SB159	0.02	12.8	18.8	20.6	12.4	8.8	20.6	1.61	1hr
SB16	0.0152	9.728	12.1	14.8	9.8	6.9	14.8	1.52	1hr
SB160	0.0064	4.096	2.5	2.9	1.9	1.6	2.9	0.71	1hr
SB1601	0.005	3.2	0.8	1.1	1.2	1.3	1.3	0.41	6hr
SB1602	0.0048	3.072	0.5	0.6	0.4	0.5	0.6	0.20	1hr
SB1603	0.0369	23.616	11.2	12.6	7.9	6.9	12.6	0.53	1hr
SB1604	0.0132	8.448	2.1	2.4	1.7	1.4	2.4	0.28	1hr
SB1605	0.0184	11.776	7.4	8.6	5.6	4.6	8.6	0.73	1hr
SB1606	0.0122	7.808	7.5	8.6	5.4	3.8	8.6	1.10	1hr
SB1607	0.0131	8.384	8	9.1	5.8	4	9.1	1.09	1hr
SB1608	0.0165	10.56	13.1	14.6	8.9	6.1	14.6	1.38	1hr
SB1609	0.0189	12.096	4.7	5.5	3.7	3.1	5.5	0.45	1hr
SB161	0.0186	11.904	5.2	6	4	2.9	6	0.50	1hr
SB1610	0.0085	5.44	5.6	6.4	4.2	2.9	6.4	1.18	1hr
SB162	0.0124	7.936	1	1.2	1.5	2	2	0.25	6hr
SB163	0.0381	24.384	29.2	31.5	18.4	14	31.5	1.29	1hr
SB164	0.0109	6.976	6	6.9	4.5	3.1	6.9	0.99	1hr
SB165	0.0112	7.168	4	4.6	3.1	2.2	4.6	0.64	1hr
SB167	0.008	5.12	3.1	3.6	2.5	1.7	3.6	0.70	1hr
SB169	0.0163	10.432	3.1	3.6	2.5	1.7	3.6	0.35	1hr
SB17	0.01	6.4	17.7	15.3	7.4	4.9	17.7	2.77	30min
SB170	0.0143	9.152	3.7	3.2	1.6	1.1	3.7	0.40	30min
SB1701	0.05	32	14.5	16.2	9.8	7.1	16.2	0.51	1hr
SB1702	0.017	10.88	4	4.6	3.1	2.3	4.6	0.42	1hr
SB1703	0.0092	5.888	1.9	2.2	1.6	1.2	2.2	0.37	1hr
SB171	0.0208	13.312	4	4.6	3.2	3.1	4.6	0.35	1hr
SB172	0.0113	7.232	2.4	2.7	1.9	1.4	2.7	0.37	1hr

			Existing Peak Discharge				Peak Flow		
Element ID	Area	Area	10yr 30min	10yr 1hr	10yr 3hr	10yr 6hr	Existing	Existing/acre	Peak Storm
	mi^2	acres	cfs	cfs	cfs	cfs	cfs	cfs/ac	
SB173	0.0224	14.336	0.5	1.3	2.6	3.4	3.4	0.24	6hr
SB174	0.0172	11.008	11.6	13.1	8	5.5	13.1	1.19	1hr
SB175	0.015	9.6	1.6	2.3	3.1	3.2	3.2	0.33	6hr
SB176	0.0156	9.984	3.1	3.6	2.5	1.7	3.6	0.36	1hr
SB177	0.008	5.12	2.3	2.7	1.9	1.4	2.7	0.53	1hr
SB18	0.0112	7.168	10.2	8.1	3.8	2.5	10.2	1.42	30min
SB180	0.0149	9.536	3.9	4.4	3	2.1	4.4	0.46	1hr
SB181	0.0146	9.344	3.3	3.8	2.6	2	3.8	0.41	1hr
SB182	0.0062	3.968	1.3	1.5	1.1	0.8	1.5	0.38	1hr
SB183	0.0236	15.104	6.3	7.2	4.7	3.2	7.2	0.48	1hr
SB184	0.0087	5.568	2.2	2.6	1.8	1.3	2.6	0.47	1hr
SB185	0.0087	5.568	2.1	2.5	1.8	1.3	2.5	0.45	1hr
SB186	0.0096	6.144	1.9	2.2	1.6	1.2	2.2	0.36	1hr
SB187	0.0096	6.144	2.2	2.6	1.8	1.3	2.6	0.42	1hr
SB188	0.0124	7.936	4.5	5.2	3.5	2.4	5.2	0.66	1hr
SB19	0.0202	12.928	5.3	5.2	2.7	1.8	5.3	0.41	30min
SB190	0.0213	13.632	4.5	5.1	3.4	2.4	5.1	0.37	1hr
SB191	0.0167	10.688	3.2	3.7	2.5	1.8	3.7	0.35	1hr
SB192	0.0104	6.656	2.1	2.5	1.8	1.3	2.5	0.38	1hr
SB193	0.0134	8.576	3	3.5	2.4	1.9	3.5	0.41	1hr
SB194	0.0116	7.424	2.3	2.7	1.9	1.4	2.7	0.36	1hr
SB195	0.0182	11.648	1.4	1.6	1.2	0.9	1.6	0.14	1hr
SB196	0.0105	6.72	1.9	2.1	1.5	1.1	2.1	0.31	1hr
SB198	0.0132	8.448	2.9	3.4	2.3	1.7	3.4	0.40	1hr
SB199	0.0236	15.104	4.3	4.9	3.3	2.3	4.9	0.32	1hr
SB2	0.0103	6.592	2.2	2.5	1.8	1.3	2.5	0.38	1hr
SB20	0.0155	9.92	4.4	4.1	2.1	1.4	4.4	0.44	30min
SB200	0.0164	10.496	5.4	6.1	4	2.8	6.1	0.58	1hr
SB201	0.0246	15.744	5.5	6.4	4.2	3.3	6.4	0.41	1hr
SB202	0.012	7.68	1.6	1.9	1.4	1.3	1.9	0.25	1hr
SB203	0.0226	14.464	4.4	5.2	3.7	4.2	5.2	0.36	1hr
SB204	0.034	21.76	5	5.8	3.8	2.7	5.8	0.27	1hr
SB205	0.029	18.56	2.4	2.8	2	1.4	2.8	0.15	1hr
SB206	0.0092	5.888	0.6	0.7	0.5	0.4	0.7	0.12	1hr
SB207	0.0125	8	1.7	2	1.6	2.2	2.2	0.28	6hr
SB208	0.0122	7.808	0.4	0.4	0.7	1	1	0.13	6hr
SB209	0.0041	2.624	2.7	3.1	2.2	1.5	3.1	1.18	1hr
SB21	0.0102	6.528	5.5	4.5	2.1	1.4	5.5	0.84	30min
SB2101	0.0209	13.376	12.5	14.1	8.7	6.2	14.1	1.05	1hr
SB2102	0.0143	9.152	2.5	3	2.3	2.8	3	0.33	1hr
SB2103	0.0236	15.104	5.5	6.5	4.7	5.4	6.5	0.43	1hr
SB2104	0.0424	27.136	19.1	21.2	12.8	10.6	21.2	0.78	1hr
SB2105	0.0287	18.368	5.8	6.8	4.7	5.3	6.8	0.37	1hr
SB2106	0.0051	3.264	1	1.2	0.9	1	1.2	0.37	1hr
SB212	0.0151	9.664	7.8	9.9	6.2	4.2	9.9	1.02	1hr
SB213	0.0129	8.256	14.2	14.4	7.5	5	14.4	1.74	1hr
SB214	0.0191	12.224	6.8	8.1	5	3.4	8.1	0.66	1hr
SB215	0.0142	9.088	7.5	9.2	6.1	4.3	9.2	1.01	1hr
SB216	0.0122	7.808	15.6	15.3	7.4	5	15.6	2.00	30min
SB217	0.0385	24.64	10.1	11.9	7.1	4.9	11.9	0.48	1hr
SB218	0.0474	30.336	54.9	49.9	24.3	16.1	54.9	1.81	30min
SB219	0.0233	14.912	19.5	21.6	11.8	8	21.6	1.45	1hr
SB22	0.0113	7.232	2.3	2.6	1.8	1.3	2.6	0.36	1hr
SB220	0.01	6.4	0.6	0.7	0.6	0.5	0.7	0.11	1hr
SB225	0.0184	11.776	0.2	0.7	1.3	1.9	1.9	0.16	6hr
SB226	0.0044	2.816	0.1	0.2	0.3	0.5	0.5	0.18	6hr
SB227	0.0178	11.392	2.2	2.5	1.9	2.4	2.5	0.22	1hr

			Existing Peak Discharge				Peak Flow		
Element ID	Area	Area	10yr 30min	10yr 1hr	10yr 3hr	10yr 6hr	Existing	Existing/acre	Peak Storm
	mi^2	acres	cfs	cfs	cfs	cfs	cfs	cfs/ac	
SB228	0.0226	14.464	4.3	4.8	3.2	2.4	4.8	0.33	1hr
SB229	0.0076	4.864	0.6	0.6	0.6	0.8	0.8	0.16	6hr
SB23	0.013	8.32	8.3	7.4	3.7	2.5	8.3	1.00	30min
SB231	0.0152	9.728	3.4	3.8	2.6	2.3	3.8	0.39	1hr
SB232	0.0199	12.736	4.3	4.9	3.2	2.7	4.9	0.38	1hr
SB233	0.0058	3.712	0.4	0.4	0.3	0.4	0.4	0.11	30min
SB234	0.0113	7.232	0.6	0.8	1.1	1.4	1.4	0.19	6hr
SB235	0.0204	13.056	4	4.6	3.2	3.4	4.6	0.35	1hr
SB24	0.0191	12.224	16.3	16.5	9.1	7.1	16.5	1.35	1hr
SB25	0.0086	5.504	4	3.8	1.9	1.3	4	0.73	30min
SB259	0.0142	9.088	19.4	15.7	7.5	4.9	19.4	2.13	30min
SB26	0.0196	12.544	30.9	27	13.2	8.6	30.9	2.46	30min
SB260	0.0065	4.16	5.5	6.3	4.1	2.8	6.3	1.51	1hr
SB261	0.0465	29.76	12.2	13.7	8.5	6.4	13.7	0.46	1hr
SB262	0.0302	19.328	6	6.9	4.6	3.7	6.9	0.36	1hr
SB27	0.0171	10.944	19.6	17.6	8.7	5.7	19.6	1.79	30min
SB276	0.0148	9.472	8.6	7.3	3.6	2.4	8.6	0.91	30min
SB276b	0.0074	4.736	4.7	4.1	2.1	1.9	4.7	0.99	30min
SB277	0.0208	13.312	39.9	30.4	13.9	9.2	39.9	3.00	30min
SB278	0.0088	5.632	7.8	8.9	5.6	3.9	8.9	1.58	1hr
SB28	0.0142	9.088	7.6	7.6	4	2.7	7.6	0.84	30min
SB280	0.0127	8.128	1.7	2	1.4	1	2	0.25	1hr
SB281	0.0147	9.408	9.9	11.2	7.2	5.6	11.2	1.19	1hr
SB282	0.0475	30.4	25.4	31	24	17.4	31	1.02	1hr
SB283	0.0051	3.264	0.7	0.7	0.4	0.4	0.7	0.21	30min
SB284	0.0494	31.616	61.1	63.2	34.8	23.1	63.2	2.00	1hr
SB285	0.0126	8.064	4.9	5.4	3.1	2.2	5.4	0.67	1hr
SB29	0.0043	2.752	0.8	1	0.6	0.4	1	0.36	1hr
SB3	0.0155	9.92	3.8	4.1	2.4	1.8	4.1	0.41	1hr
SB30	0.0076	4.864	1.8	2	1.2	0.8	2	0.41	1hr
SB31	0.0218	13.952	13.7	16.5	13.1	9.8	16.5	1.18	1hr
SB3101	0.0277	17.728	5.8	7	7.1	7.8	7.8	0.44	6hr
SB3102	0.0141	9.024	3.8	4.6	4.3	4.4	4.6	0.51	1hr
SB3103	0.0096	6.144	8.1	9.2	5.8	4.1	9.2	1.50	1hr
SB3104	0.0305	19.52	31	33.4	19.2	13.4	33.4	1.71	1hr
SB3105	0.0342	21.888	38.4	40.7	23.1	15.8	40.7	1.86	1hr
SB315	0.0148	9.472	1.1	1.2	0.9	0.7	1.2	0.13	1hr
SB316	0.0213	13.632	7.2	8.3	5.3	3.7	8.3	0.61	1hr
SB32	0.0215	13.76	4.6	5.8	5	3.7	5.8	0.42	1hr
SB3201	0.0209	13.376	4.8	5.8	5.5	6	6	0.45	6hr
SB3202	0.0189	12.096	15.1	16.8	10.3	7.6	16.8	1.39	1hr
SB3203	0.0092	5.888	6.5	7.5	4.9	3.7	7.5	1.27	1hr
SB3204	0.0081	5.184	6.7	7.6	4.9	3.5	7.6	1.47	1hr
SB3205	0.0182	11.648	18.2	20.1	11.9	8.2	20.1	1.73	1hr
SB3206	0.0255	16.32	27.3	29.4	17	11.6	29.4	1.80	1hr
SB323	0.2375	152	11.9	16.5	15.1	11.3	16.5	0.11	1hr
SB324	0.0035	2.24	3.2	3.4	1.8	1.2	3.4	1.52	1hr
SB325	0.0385	24.64	0.5	0.8	2.5	3.7	3.7	0.15	6hr
SB328	0.0143	9.152	4.6	5.3	3.5	2.5	5.3	0.58	1hr
SB33	0.0119	7.616	3.2	3.8	2.9	2.1	3.8	0.50	1hr
SB335	0.021	13.44	11.3	13.8	8.9	6.1	13.8	1.03	1hr
SB337	0.0016	1.024	0.7	0.7	0.4	0.4	0.7	0.68	30min
SB338	0.0281	17.984	3.5	4	2.7	2.1	4	0.22	1hr
SB339	0.0183	11.712	12.5	14.5	9.6	6.7	14.5	1.24	1hr
SB340	0.0178	11.392	3.8	4.4	3	2.1	4.4	0.39	1hr
SB341	0.0066	4.224	0.9	1	0.8	0.6	1	0.24	1hr
SB342	0.0096	6.144	1.4	1.6	1.2	0.9	1.6	0.26	1hr

			Existing Peak Discharge				Peak Flow		
Element ID	Area	Area	10yr 30min	10yr 1hr	10yr 3hr	10yr 6hr	Existing	Existing/acre	Peak Storm
	mi^2	acres	cfs	cfs	cfs	cfs	cfs	cfs/ac	
SB343	0.0031	1.984	0.9	1	0.8	0.6	1	0.50	1hr
SB344	0.0208	13.312	27.8	25.2	12.4	8.2	27.8	2.09	30min
SB345	0.0213	13.632	10.4	9.9	5.1	3.4	10.4	0.76	30min
SB346	0.0034	2.176	0.7	0.7	0.5	0.4	0.7	0.32	30min
SB347	0.0229	14.656	2.1	2.4	1.7	1.2	2.4	0.16	1hr
SB348	0.0115	7.36	4.1	4.1	2.2	1.5	4.1	0.56	30min
SB349	0.0591	37.824	16.9	18.7	11.1	7.6	18.7	0.49	1hr
SB352	0.0117	7.488	2	2.3	1.6	1.2	2.3	0.31	1hr
SB353	0.0173	11.072	3.3	3.8	2.6	1.9	3.8	0.34	1hr
SB354	0.0241	15.424	5.4	6.2	4.1	2.8	6.2	0.40	1hr
SB355	0.0168	10.752	4.2	4.9	3.3	2.3	4.9	0.46	1hr
SB356	0.0108	6.912	2.3	2.7	1.9	1.4	2.7	0.39	1hr
SB357	0.0227	14.528	5.5	6.3	4.1	2.9	6.3	0.43	1hr
SB358	0.0275	17.6	5.4	6.2	4.1	2.8	6.2	0.35	1hr
SB359	0.021	13.44	4.6	5.3	3.5	2.5	5.3	0.39	1hr
SB360	0.0458	29.312	12.5	14	8.6	5.9	14	0.48	1hr
SB361	0.0243	15.552	9.9	11.2	6.9	4.8	11.2	0.72	1hr
SB363	0.0275	17.6	23.8	25.8	15.1	10.1	25.8	1.47	1hr
SB364	0.0118	7.552	1.6	1.8	1.3	1	1.8	0.24	1hr
SB367	0.0198	12.672	2.9	3.3	2.3	1.6	3.3	0.26	1hr
SB368	0.0241	15.424	12.7	14.2	8.7	5.9	14.2	0.92	1hr
SB369	0.0221	14.144	8	7.2	3.6	2.4	8	0.57	30min
SB37	0.0167	10.688	6.1	6	3.1	2.1	6.1	0.57	30min
SB370	0.0134	8.576	2.7	3.1	2.2	1.5	3.1	0.36	1hr
SB372	0.0225	14.4	0.4	0.6	1.4	2.2	2.2	0.15	6hr
SB375	0.0647	41.408	0.7	3.3	6	8	8	0.19	6hr
SB376	0.0141	9.024	2.5	2.8	2	1.8	2.8	0.31	1hr
SB379	0.0259	16.576	5.9	6.7	4.4	3.2	6.7	0.40	1hr
SB38	0.0196	12.544	9.9	8.5	4.1	2.7	9.9	0.79	30min
SB380	0.0166	10.624	0.3	0.3	0.3	0.6	0.6	0.06	6hr
SB381	0.0254	16.256	2.8	3.3	2.4	2.7	3.3	0.20	1hr
SB382	0.0268	17.152	3.6	4.1	2.9	2.9	4.1	0.24	1hr
SB383	0.013	8.32	13.1	14.6	8.9	6.1	14.6	1.75	1hr
SB384	0.0063	4.032	1	1.1	0.8	0.6	1.1	0.27	1hr
SB387	0.0108	6.912	2.1	2.5	1.8	2	2.5	0.36	1hr
SB389	0.0179	11.456	3.1	3.6	2.5	1.8	3.6	0.31	1hr
SB39	0.0149	9.536	10.7	12.1	7.5	5.1	12.1	1.27	1hr
SB390	0.0193	12.352	6.1	6.9	4.5	3.1	6.9	0.56	1hr
SB391	0.0129	8.256	2.1	2.4	1.8	1.3	2.4	0.29	1hr
SB392	0.0217	13.888	3.7	4.2	2.9	2.5	4.2	0.30	1hr
SB393	0.0232	14.848	3	3.5	2.4	1.8	3.5	0.24	1hr
SB394	0.0103	6.592	1.6	1.9	1.3	1	1.9	0.29	1hr
SB395	0.0211	13.504	4.6	5.3	3.5	2.5	5.3	0.39	1hr
SB396	0.0236	15.104	4.4	5.6	4.2	2.9	5.6	0.37	1hr
SB397	0.0123	7.872	2.9	3.5	2.2	1.5	3.5	0.44	1hr
SB398	0.0107	6.848	10.6	10.7	5.4	3.7	10.7	1.56	1hr
SB399	0.0367	23.488	8.6	10.5	6.7	4.6	10.5	0.45	1hr
SB4	0.015	9.6	6.4	6	3.1	2.1	6.4	0.67	30min
SB40	0.0211	13.504	20.7	19.1	9.4	6.2	20.7	1.53	30min
SB400	0.0271	17.344	5.7	7	4.9	3.4	7	0.40	1hr
SB402	0.0159	10.176	8.2	10.1	6.6	4.6	10.1	0.99	1hr
SB407	0.0198	12.672	3.5	4	2.7	2	4	0.32	1hr
SB408	0.0273	17.472	29.1	31.3	18	12.1	31.3	1.79	1hr
SB409	0.017	10.88	14.2	15.8	9.6	6.5	15.8	1.45	1hr
SB41	0.0183	11.712	9.8	8.1	3.8	2.5	9.8	0.84	30min
SB412	0.0297	19.008	26.8	28.9	16.7	11.2	28.9	1.52	1hr
SB413	0.0166	10.624	12.8	12.1	6.2	4.1	12.8	1.20	30min

			Existing Peak Discharge				Peak Flow		
Element ID	Area	Area	10yr 30min	10yr 1hr	10yr 3hr	10yr 6hr	Existing	Existing/acre	Peak Storm
	mi^2	acres	cfs	cfs	cfs	cfs	cfs	cfs/ac	
SB414	0.0134	8.576	13.6	15.1	9.2	6.4	15.1	1.76	1hr
SB415	0.026	16.64	22.3	24.2	14.2	9.7	24.2	1.45	1hr
SB416	0.0302	19.328	20.7	21.6	12.2	8.2	21.6	1.12	1hr
SB417	0.0133	8.512	13.9	15.5	9.4	6.4	15.5	1.82	1hr
SB418	0.0183	11.712	16.2	17.9	10.7	7.3	17.9	1.53	1hr
SB419	0.007	4.48	6.4	7.4	4.8	3.3	7.4	1.65	1hr
SB42	0.0125	8	8.4	6.9	3.3	2.2	8.4	1.05	30min
SB420	0.0252	16.128	12.4	14.4	10	8.6	14.4	0.89	1hr
SB420A	0.0158	10.112	14.6	11.4	5.3	3.5	14.6	1.44	30min
SB420b	0.0039	2.496	1.5	1.8	1.4	1.3	1.8	0.72	1hr
SB420C	0.0126	8.064	21	16.2	7.5	4.9	21	2.60	30min
SB421	0.0232	14.848	21.1	23.9	14.4	9.8	23.9	1.61	1hr
SB421a	0.0039	2.496	2.4	2.9	2.2	1.6	2.9	1.16	1hr
SB421b	0.0022	1.408	0	0	0	0.1	0.1	0.07	6hr
SB422	0.0399	25.536	4.8	5.5	3.6	2.6	5.5	0.22	1hr
SB422b	0.0247	15.808	10.7	12	7.4	5.1	12	0.76	1hr
SB424	0.0276	17.664	6.3	7.2	4.7	3.2	7.2	0.41	1hr
SB425	0.0179	11.456	3.1	3.6	2.5	1.7	3.6	0.31	1hr
SB427	0.0148	9.472	2.5	2.9	2	1.4	2.9	0.31	1hr
SB428	0.0455	29.12	7.6	8.6	5.5	3.8	8.6	0.30	1hr
SB429	0.0234	14.976	5.2	6	3.9	2.8	6	0.40	1hr
SB43	0.0129	8.256	0.9	0.9	0.5	0.4	0.9	0.11	30min
SB430	0.0273	17.472	5.6	6.5	4.2	2.9	6.5	0.37	1hr
SB431	0.0606	38.784	12.9	14.5	9.1	9.1	14.5	0.37	1hr
SB432	0.0576	36.864	8.8	10.2	6.9	9.1	10.2	0.28	1hr
SB433	0.0374	23.936	8.6	9.7	6.1	4.3	9.7	0.41	1hr
SB434	0.0347	22.208	7.1	8.1	5.2	3.6	8.1	0.36	1hr
SB436	0.0253	16.192	26.7	28.8	16.7	11.2	28.8	1.78	1hr
SB438	0.0208	13.312	26.9	26.8	13.6	9.1	26.9	2.02	30min
SB44	0.0191	12.224	6.2	7.1	4.6	3.2	7.1	0.58	1hr
SB440	0.047	30.08	15.6	21.5	17.5	13	21.5	0.71	1hr
SB441	0.0077	4.928	0.8	0.9	0.8	0.6	0.9	0.18	1hr
SB442	0.0113	7.232	0.4	0.5	0.4	0.4	0.5	0.07	1hr
SB443	0.0065	4.16	0.7	0.9	0.8	0.6	0.9	0.22	1hr
SB444	0.0944	60.416	43.7	54.5	36.9	25.6	54.5	0.90	1hr
SB444B	0.0242	15.488	8.9	11.4	9.1	6.5	11.4	0.74	1hr
SB445	0.0206	13.184	5.6	5.8	3	2.1	5.8	0.44	1hr
SB446	0.0201	12.864	2.7	3.3	2.1	1.5	3.3	0.26	1hr
SB449	0.0174	11.136	5	5.4	2.9	2	5.4	0.48	1hr
SB45	0.015	9.6	1.8	2.2	2	1.6	2.2	0.23	1hr
SB451	0.017	10.88	7.2	9.1	6.7	4.8	9.1	0.84	1hr
SB452	0.0156	9.984	8.7	9.6	5.2	3.5	9.6	0.96	1hr
SB453	0.0171	10.944	9.7	10.2	5.4	4.4	10.2	0.93	1hr
SB454	0.0134	8.576	8.1	9.6	5.8	4	9.6	1.12	1hr
SB455	0.0503	32.192	36.8	46.8	28.2	19.5	46.8	1.45	1hr
SB457	0.0548	35.072	53.6	51.5	25.8	16.9	53.6	1.53	30min
SB458	0.0711	45.504	49.6	58.2	35.6	24.2	58.2	1.28	1hr
SB459	0.0454	29.056	8.5	10.7	8.3	5.9	10.7	0.37	1hr
SB46	0.0211	13.504	29.6	25.4	12.2	8.1	29.6	2.19	30min
SB460	0.0415	26.56	5.9	8.1	7.6	6.1	8.1	0.30	1hr
SB461	0.0493	31.552	6.6	9.3	8.9	6.9	9.3	0.29	1hr
SB462	0.0271	17.344	5.6	6.4	4.2	2.9	6.4	0.37	1hr
SB463	0.0031	1.984	0.2	0.3	0.2	0.2	0.3	0.15	1hr
SB464	0.0202	12.928	3.4	3.9	2.7	1.9	3.9	0.30	1hr
SB466	0.0315	20.16	0.6	0.7	0.5	1.3	1.3	0.06	6hr
SB467	0.0267	17.088	6.7	7.6	4.9	3.4	7.6	0.44	1hr
SB468	0.021	13.44	1.7	1.9	1.4	1	1.9	0.14	1hr

			Existing Peak Discharge				Peak Flow		
Element ID	Area	Area	10yr 30min	10yr 1hr	10yr 3hr	10yr 6hr	Existing	Existing/acre	Peak Storm
	mi^2	acres	cfs	cfs	cfs	cfs	cfs	cfs/ac	
SB469	0.0162	10.368	3.6	4.1	2.8	2	4.1	0.40	1hr
SB47	0.021	13.44	6.7	7.6	4.9	3.4	7.6	0.57	1hr
SB470	0.0068	4.352	0.4	0.5	0.4	0.7	0.7	0.16	6hr
SB471	0.0152	9.728	2.6	3	2.1	1.6	3	0.31	1hr
SB472	0.0255	16.32	4.7	5.4	3.6	2.5	5.4	0.33	1hr
SB473	0.0288	18.432	7.9	9	5.7	4.1	9	0.49	1hr
SB475	0.0188	12.032	4.2	4.9	3.3	2.3	4.9	0.41	1hr
SB478	0.0185	11.84	3.8	4.4	3	2.2	4.4	0.37	1hr
SB479	0.0085	5.44	7	8	5.1	3.5	8	1.47	1hr
SB48	0.0167	10.688	3.2	3.7	2.5	1.8	3.7	0.35	1hr
SB480	0.0359	22.976	32.2	34.6	19.8	13.3	34.6	1.51	1hr
SB481	0.0044	2.816	0.9	1	0.7	0.5	1	0.36	1hr
SB482	0.0073	4.672	6.3	7.2	4.6	3.2	7.2	1.54	1hr
SB483	0.0096	6.144	6.3	5.9	3.1	2.1	6.3	1.03	30min
SB484	0.0061	3.904	1.3	1.4	1	0.7	1.4	0.36	1hr
SB485	0.0056	3.584	1.8	2.1	1.5	1.2	2.1	0.59	1hr
SB486	0.0514	32.896	15.6	17.3	10.4	7.1	17.3	0.53	1hr
SB487	0.0191	12.224	4.7	5.4	3.6	2.6	5.4	0.44	1hr
SB488	0.121	77.44	35.2	37.6	21.4	14.4	37.6	0.49	1hr
SB49	0.0219	14.016	15.1	16.5	9.6	6.5	16.5	1.18	1hr
SB490	0.0265	16.96	21	22.9	13.5	9.1	22.9	1.35	1hr
SB493	0.0224	14.336	3.7	4.4	3.2	4	4.4	0.31	1hr
SB494	0.0075	4.8	0.6	0.8	0.8	1.1	1.1	0.23	6hr
SB496	0.0237	15.168	0.6	0.7	0.5	1	1	0.07	6hr
SB497	0.0414	26.496	7	8.2	5.7	7.4	8.2	0.31	1hr
SB498	0.0107	6.848	1.3	1.5	1.1	0.8	1.5	0.22	1hr
SB499	0.0067	4.288	1.1	1.2	0.9	0.7	1.2	0.28	1hr
SB5	0.0189	12.096	7.6	7.4	3.8	2.8	7.6	0.63	30min
SB50	0.0162	10.368	10	9.2	4.8	4	10	0.96	30min
SB500	0.0196	12.544	0.7	0.7	0.6	0.8	0.8	0.06	6hr
SB501	0.0105	6.72	3.1	3.6	2.5	1.7	3.6	0.54	1hr
SB502	0.1761	112.704	61.6	69.5	38.2	26.1	69.5	0.62	1hr
SB504	0.0477	30.528	10.7	13.6	9.8	7	13.6	0.45	1hr
SB505	0.0454	29.056	18.6	19.1	9.9	6.6	19.1	0.66	1hr
SB506	0.064	40.96	11.6	16	12.8	9.2	16	0.39	1hr
SB507	0.0133	8.512	3	3.4	2.4	1.7	3.4	0.40	1hr
SB508	0.0082	5.248	2	2.3	1.6	1.2	2.3	0.44	1hr
SB509	0.0187	11.968	0.2	0.3	0.8	1.3	1.3	0.11	6hr
SB51	0.0194	12.416	25	22.2	10.9	7.3	25	2.01	30min
SB510	0.0212	13.568	4.9	5.6	3.7	2.6	5.6	0.41	1hr
SB511	0.0124	7.936	1.3	1.5	1.2	1.2	1.5	0.19	1hr
SB512	0.0055	3.52	1.3	1.5	1.1	0.8	1.5	0.43	1hr
SB513	0.0219	14.016	4.8	5.6	3.7	2.6	5.6	0.40	1hr
SB514	0.0201	12.864	1.1	1.2	0.7	0.9	1.2	0.09	1hr
SB515	0.0244	15.616	10.2	9.8	5.1	3.4	10.2	0.65	30min
SB516	0.06	38.4	76.5	74	38	25.1	76.5	1.99	30min
SB517	0.022	14.08	4.9	5.6	3.7	2.6	5.6	0.40	1hr
SB518	0.019	12.16	7	8	5.1	3.5	8	0.66	1hr
SB519	0.0261	16.704	6.2	7.1	4.6	3.2	7.1	0.43	1hr
SB52	0.0059	3.776	2.2	2.5	1.5	1.1	2.5	0.66	1hr
SB520	0.0045	2.88	1.6	1.9	1.4	1.1	1.9	0.66	1hr
SB521	0.00506	3.2384	8.1	6.5	3	2	8.1	2.50	30min
SB522	0.0198	12.672	3.9	4.5	3	2.1	4.5	0.36	1hr
SB523	0.0149	9.536	8.1	9.2	5.8	4	9.2	0.96	1hr
SB524	0.0367	23.488	33.1	35.5	20.3	14	35.5	1.51	1hr
SB525	0.0066	4.224	2.6	3	2.1	1.5	3	0.71	1hr
SB526	0.0314	20.096	23.5	25.6	15	10.6	25.6	1.27	1hr

			Existing Peak Discharge				Peak Flow		
Element ID	Area	Area	10yr 30min	10yr 1hr	10yr 3hr	10yr 6hr	Existing	Existing/acre	Peak Storm
	mi^2	acres	cfs	cfs	cfs	cfs	cfs	cfs/ac	
SB527	0.0281	17.984	25.5	27.6	16	10.9	27.6	1.53	1hr
SB528	0.0215	13.76	2.1	2.4	1.7	1.3	2.4	0.17	1hr
SB529	0.0574	36.736	19.3	21.4	12.9	10.8	21.4	0.58	1hr
SB53	0.0087	5.568	3	3.2	1.8	1.3	3.2	0.57	1hr
SB530	0.0684	43.776	34.1	37	23.4	22.3	37	0.85	1hr
SB531	0.0638	40.832	21.9	27.5	22.5	20.6	27.5	0.67	1hr
SB531a	0.0069	4.416	3.1	3.6	2.7	2.3	3.6	0.82	1hr
SB531b	0.0177	11.328	11.2	12.7	8.1	6.5	12.7	1.12	1hr
SB532	0.0047	3.008	4	4.6	3.1	2.2	4.6	1.53	1hr
SB533	0.0264	16.896	20.2	22.3	13.2	9.6	22.3	1.32	1hr
SB534	0.0287	18.368	5.4	6.1	4	2.9	6.1	0.33	1hr
SB535	0.0504	32.256	31	33.5	19.7	16	33.5	1.04	1hr
SB536	0.0225	14.4	13.3	14.9	9.3	7.4	14.9	1.03	1hr
SB537	0.1123	71.872	57	59.9	37.2	36.2	59.9	0.83	1hr
SB538	0.025	16	9	10.2	6.4	4.4	10.2	0.64	1hr
SB539	0.0255	16.32	26.9	29	16.8	11.3	29	1.78	1hr
SB54	0.0064	4.096	4.3	5	3.3	2.3	5	1.22	1hr
SB540	0.0229	14.656	20.8	22.8	13.6	9.8	22.8	1.56	1hr
SB541	0.0197	12.608	16.9	18.7	11.1	7.5	18.7	1.48	1hr
SB542	0.0592	37.888	47.3	49.2	27.7	19.3	49.2	1.30	1hr
SB543	0.0191	12.224	3.1	3.6	2.5	1.9	3.6	0.29	1hr
SB544	0.0099	6.336	8.9	10.1	6.3	4.4	10.1	1.59	1hr
SB545	0.0017	1.088	0.9	1	0.8	0.6	1	0.92	1hr
SB546	0.0059	3.776	5.2	6	3.9	2.7	6	1.59	1hr
SB547	0.0183	11.712	19.4	21.4	12.6	8.5	21.4	1.83	1hr
SB548	0.0066	4.224	4.9	5.7	3.7	2.6	5.7	1.35	1hr
SB549	0.0279	17.856	11.6	13.1	8.1	5.7	13.1	0.73	1hr
SB55	0.007	4.48	4.8	5.5	3.7	2.6	5.5	1.23	1hr
SB550	0.0374	23.936	16.4	18.1	10.9	7.7	18.1	0.76	1hr
SB553	0.0435	27.84	49.9	51.8	29	19.3	51.8	1.86	1hr
SB554	0.0611	39.104	28.9	31.2	17.9	12.1	31.2	0.80	1hr
SB555	0.0374	23.936	10.4	11.7	7.2	5	11.7	0.49	1hr
SB556	0.0562	35.968	3.5	4	2.7	2.5	4	0.11	1hr
SB557	0.0353	22.592	2	2.3	1.6	1.6	2.3	0.10	1hr
SB558	0.0575	36.8	14.9	16.5	10	6.8	16.5	0.45	1hr
SB559	0.0978	62.592	30.2	32.5	18.7	12.6	32.5	0.52	1hr
SB56	0.009	5.76	8.7	7.1	3.4	2.3	8.7	1.51	30min
SB560	0.026	16.64	5.9	6.8	4.5	3.4	6.8	0.41	1hr
SB562	0.0206	13.184	0.7	1.2	2.4	3.2	3.2	0.24	6hr
SB563	0.0308	19.712	13	14.6	8.9	6.3	14.6	0.74	1hr
SB566	0.0695	44.48	20.5	22.8	13.9	13.7	22.8	0.51	1hr
SB568	0.0127	8.128	2.9	3.4	2.3	1.7	3.4	0.42	1hr
SB57	0.0077	4.928	5	5.2	2.9	2	5.2	1.06	1hr
SB570	0.0124	7.936	3	3.4	2.4	1.7	3.4	0.43	1hr
SB572	0.0221	14.144	4.6	5.3	3.6	2.5	5.3	0.37	1hr
SB573	0.0652	41.728	18.9	20.8	12.3	8.5	20.8	0.50	1hr
SB574	0.0211	13.504	10.9	12.4	7.7	5.8	12.4	0.92	1hr
SB575	0.0208	13.312	8.2	9.3	5.9	4.1	9.3	0.70	1hr
SB576	0.0167	10.688	5.6	6.5	4.2	3	6.5	0.61	1hr
SB577	0.0419	26.816	30.4	32.8	19.5	15.5	32.8	1.22	1hr
SB578	0.1268	81.152	229.7	189.8	90.4	59	229.7	2.83	30min
SB579	0.0154	9.856	1.2	1.3	1	1.4	1.4	0.14	6hr
SB58	0.0176	11.264	15.7	17.6	10.7	7.3	17.6	1.56	1hr
SB580	0.0081	5.184	1.9	2.2	1.6	1.1	2.2	0.42	1hr
SB581	0.0074	4.736	0.2	0.3	0.4	0.7	0.7	0.15	6hr
SB582	0.0343	21.952	5.4	6.2	4.1	2.9	6.2	0.28	1hr
SB583	0.0202	12.928	11.8	13.3	8.2	5.9	13.3	1.03	1hr

			Existing Peak Discharge				Peak Flow		
Element ID	Area	Area	10yr 30min	10yr 1hr	10yr 3hr	10yr 6hr	Existing	Existing/acre	Peak Storm
	mi^2	acres	cfs	cfs	cfs	cfs	cfs	cfs/ac	
SB584	0.0155	9.92	6.7	7.7	4.9	3.4	7.7	0.78	1hr
SB585	0.0236	15.104	21.4	23.4	13.7	9.3	23.4	1.55	1hr
SB586	0.0103	6.592	1.5	1.8	1.3	0.9	1.8	0.27	1hr
SB587	0.039	24.96	5.9	6.8	4.4	3.1	6.8	0.27	1hr
SB588	0.0088	5.632	6.3	7.2	4.6	3.2	7.2	1.28	1hr
SB589	0.0357	22.848	7.7	8.8	5.6	3.9	8.8	0.39	1hr
SB59	0.007	4.48	9.5	8.5	4.4	3	9.5	2.12	30min
SB590	0.0316	20.224	2.7	3.1	2.2	1.6	3.1	0.15	1hr
SB591	0.0389	24.896	0.5	0.5	0.6	1.6	1.6	0.06	6hr
SB592	0.0101	6.464	1.5	1.7	1.3	1	1.7	0.26	1hr
SB593	0.0134	8.576	3.9	3.8	2	1.4	3.9	0.45	30min
SB594	0.0081	5.184	5.4	6.2	4.2	3.2	6.2	1.20	1hr
SB595	0.047	30.08	45.6	47.6	26.7	17.8	47.6	1.58	1hr
SB595a	0.0079	5.056	5.7	6.6	4.3	3	6.6	1.31	1hr
SB596	0.0171	10.944	14.3	15.9	9.6	6.5	15.9	1.45	1hr
SB597	0.0066	4.224	4.4	5.1	3.4	2.4	5.1	1.21	1hr
SB598	0.0398	25.472	25.5	27.6	16	11	27.6	1.08	1hr
SB599	0.0225	14.4	15.9	17.6	10.6	7.2	17.6	1.22	1hr
SB6	0.0145	9.28	6	5.7	2.9	1.9	6	0.65	30min
SB60	0.0083	5.312	8.7	8.4	4.3	2.8	8.7	1.64	30min
SB600	0.0105	6.72	3.5	5	4.7	3.7	5	0.74	1hr
SB602	0.0411	26.304	11.9	13.2	7.4	5.1	13.2	0.50	1hr
SB603	0.0326	20.864	18.8	25.5	18.7	13.4	25.5	1.22	1hr
SB604	0.0183	11.712	4.6	4.6	2.3	1.6	4.6	0.39	30min
SB605	0.0146	9.344	2.8	3.3	2	1.4	3.3	0.35	1hr
SB607	0.0215	13.76	7.6	10.3	7.9	5.7	10.3	0.75	1hr
SB608	0.0099	6.336	7.2	7.6	4	2.7	7.6	1.20	1hr
SB61	0.0061	3.904	6.6	6.5	3.3	2.4	6.6	1.69	30min
SB612	0.015	9.6	5.1	5.8	3.2	2.2	5.8	0.60	1hr
SB613	0.0098	6.272	3.5	3.8	2.1	1.5	3.8	0.61	1hr
SB614	0.0049	3.136	1.7	1.9	1	0.8	1.9	0.61	1hr
SB615	0.0074	4.736	5.7	6.1	3.4	2.3	6.1	1.29	1hr
SB616	0.002	1.28	1.5	1.4	0.7	0.5	1.5	1.17	30min
SB618	0.0038	2.432	5.1	4.6	2.3	1.5	5.1	2.10	30min
SB619	0.0049	3.136	5.1	5.2	2.8	1.9	5.2	1.66	1hr
SB62	0.0023	1.472	1.8	1.6	0.8	0.5	1.8	1.22	30min
SB620	0.0093	5.952	1.1	1.5	1.2	0.9	1.5	0.25	1hr
SB621	0.0228	14.592	13.6	14.7	8.3	5.6	14.7	1.01	1hr
SB622	0.0152	9.728	13.8	15.5	9.2	6.3	15.5	1.59	1hr
SB623	0.0069	4.416	5.6	6.5	4.3	3	6.5	1.47	1hr
SB624	0.0335	21.44	26.1	30.4	19.6	13.5	30.4	1.42	1hr
SB624b	0.0155	9.92	5.7	6.9	4.8	3.4	6.9	0.70	1hr
SB625	0.0096	6.144	8.5	9.3	5.5	3.8	9.3	1.51	1hr
SB626	0.0104	6.656	3.2	3.6	2.3	1.6	3.6	0.54	1hr
SB627	0.0139	8.896	5.3	6.6	5.7	4.9	6.6	0.74	1hr
SB628	0.0046	2.944	2.7	3.2	2.4	1.9	3.2	1.09	1hr
SB63	0.0081	5.184	1.1	1.2	0.7	0.5	1.2	0.23	1hr
SB630	0.024	15.36	20.8	22.5	13.1	8.8	22.5	1.46	1hr
SB631	0.0192	12.288	11.4	13.2	8.7	6	13.2	1.07	1hr
SB632	0.0157	10.048	26.9	23.1	11.2	7.3	26.9	2.68	30min
SB634	0.0241	15.424	12	11.9	6.3	4.2	12	0.78	30min
SB635	0.0048	3.072	3.5	3.4	1.8	1.2	3.5	1.14	30min
SB637	0.0103	6.592	5.8	6.1	3.4	2.5	6.1	0.93	1hr
SB639	0.0208	13.312	10.8	9.9	5	3.3	10.8	0.81	30min
SB64	0.0138	8.832	1.2	1	0.5	0.6	1.2	0.14	30min
SB640	0.0147	9.408	6.6	6.1	3.1	2	6.6	0.70	30min
SB641	0.014	8.96	4.9	4.8	2.5	2	4.9	0.55	30min

			Existing Peak Discharge				Peak Flow		
Element ID	Area	Area	10yr 30min	10yr 1hr	10yr 3hr	10yr 6hr	Existing	Existing/acre	Peak Storm
	mi^2	acres	cfs	cfs	cfs	cfs	cfs	cfs/ac	
SB642	0.0143	9.152	3.7	4.1	2.5	2	4.1	0.45	1hr
SB643	0.0107	6.848	2.8	3.4	2.5	1.8	3.4	0.50	1hr
SB644	0.0127	8.128	3.5	4.1	3.1	2.2	4.1	0.50	1hr
SB645	0.0005	0.32	0.2	0.3	0.2	0.2	0.3	0.94	1hr
SB646	0.0497	31.808	16.5	18.3	11.3	10.2	18.3	0.58	1hr
SB647	0.0082	5.248	6.3	7.2	4.6	3.2	7.2	1.37	1hr
SB648	0.0028	1.792	2.1	2.4	1.7	1.2	2.4	1.34	1hr
SB65	0.0106	6.784	2.1	2.4	1.5	1.1	2.4	0.35	1hr
SB650	0.0023	1.472	1.6	1.9	1.4	1	1.9	1.29	1hr
SB652	0.003	1.92	2.5	2.9	2	1.4	2.9	1.51	1hr
SB654	0.0098	6.272	4.3	5.1	4.1	3.1	5.1	0.81	1hr
SB655	0.0074	4.736	4.3	5.2	4.1	3.1	5.2	1.10	1hr
SB656	0.0065	4.16	3.5	4.2	3.4	2.5	4.2	1.01	1hr
SB658	0.0086	5.504	6	5.6	2.8	1.9	6	1.09	30min
SB66	0.012	7.68	4.7	4.7	2.4	1.8	4.7	0.61	30min
SB660	0.0086	5.504	3.9	3.7	1.9	1.3	3.9	0.71	30min
SB661	0.1596	102.144	37.5	43.4	28.4	20.1	43.4	0.42	1hr
SB662	0.0483	30.912	8.5	10.1	7.5	5.4	10.1	0.33	1hr
SB664	0.0261	16.704	21.5	25.3	17.4	12.2	25.3	1.51	1hr
SB665	0.0151	9.664	7.2	8.2	5.3	3.7	8.2	0.85	1hr
SB666	0.007	4.48	2.6	3	2.1	1.5	3	0.67	1hr
SB667	0.0383	24.512	1.3	1.7	2.5	3.8	3.8	0.16	6hr
SB668	0.0043	2.752	0.6	0.7	0.6	0.5	0.7	0.25	1hr
SB669	0.0179	11.456	1	1.2	1	0.8	1.2	0.10	1hr
SB67	0.0115	7.36	5	5.5	3	2.1	5.5	0.75	1hr
SB670	0.0113	7.232	10	11.6	7.7	5.4	11.6	1.60	1hr
SB671	0.0293	18.752	30.6	34.3	20.7	14	34.3	1.83	1hr
SB672	0.0242	15.488	8.3	9.9	7.4	5.5	9.9	0.64	1hr
SB673	0.035	22.4	17.7	21	14.7	10.5	21	0.94	1hr
SB68	0.0092	5.888	2	2.2	1.3	0.9	2.2	0.37	1hr
SB69	0.0112	7.168	1.9	2.1	1.2	0.9	2.1	0.29	1hr
SB69b	0.0027	1.728	1.8	1.7	0.9	0.6	1.8	1.04	30min
SB7	0.0111	7.104	3.2	3.1	1.6	1.1	3.2	0.45	30min
SB70	0.0064	4.096	2.7	2.9	1.8	1.6	2.9	0.71	1hr
SB71	0.0117	7.488	3.6	3.6	1.9	1.3	3.6	0.48	30min
SB72	0.0021	1.344	3.2	3	1.5	1	3.2	2.38	30min
SB73	0.023	14.72	9.4	9.4	4.9	3.3	9.4	0.64	30min
SB73b	0.003759	2.40576	1.6	1.6	0.8	0.5	1.6	0.67	30min
SB74	0.0019	1.216	2.4	2.2	1.1	0.8	2.4	1.97	30min
SB75	0.0038	2.432	0.6	0.5	0.3	0.2	0.6	0.25	30min
SB76	0.0152	9.728	3.8	3.8	2	1.4	3.8	0.39	30min
SB77	0.0071	4.544	6.1	5.4	2.6	1.8	6.1	1.34	30min
SB77b	0.0165	10.56	6.1	5.6	3.5	4.1	6.1	0.58	30min
SB78	0.0196	12.544	20.9	21	11.3	8.2	21	1.67	1hr
SB79	0.0091	5.824	7.2	5.7	2.6	1.8	7.2	1.24	30min
SB8	0.0199	12.736	13.4	14.7	8.7	5.9	14.7	1.15	1hr
SB80	0.0042	2.688	4.6	4.3	2.2	1.5	4.6	1.71	30min
SB81	0.0117	7.488	2.6	2.8	1.6	1.1	2.8	0.37	1hr
SB82	0.0052	3.328	9	7.8	3.9	2.5	9	2.70	30min
SB83	0.0089	5.696	3.1	3.6	2.7	2.6	3.6	0.63	1hr
SB84	0.0059	3.776	1.8	2	1.2	0.8	2	0.53	1hr
SB84b	0.0035	2.24	1.5	1.5	0.8	0.7	1.5	0.67	30min
SB85	0.0185	11.84	10.4	10.1	5.3	3.5	10.4	0.88	30min
SB86	0.012	7.68	3	3.3	1.9	1.3	3.3	0.43	1hr
SB87	0.0222	14.208	6.3	6.7	3.7	2.5	6.7	0.47	1hr
SB89	0.0104	6.656	2	2.3	1.7	1.2	2.3	0.35	1hr
SB9	0.0141	9.024	3.7	3.7	2.1	1.4	3.7	0.41	30min

			Existing Peak Discharge				Peak Flow		
Element ID	Area	Area	10yr 30min	10yr 1hr	10yr 3hr	10yr 6hr	Existing	Existing/acre	Peak Storm
	mi^2	acres	cfs	cfs	cfs	cfs	cfs	cfs/ac	
SB90	0.0125	8	0.6	0.6	0.5	0.6	0.6	0.08	30min
SB92	0.0168	10.752	2.8	3.2	2.2	1.5	3.2	0.30	1hr
SB93	0.0227	14.528	9.1	8	3.9	2.6	9.1	0.63	30min
SB94	0.0068	4.352	1.4	1.5	1.1	0.8	1.5	0.34	1hr
SB95	0.0151	9.664	1.8	2.1	1.5	1.1	2.1	0.22	1hr
SB96	0.0049	3.136	0.7	0.7	0.5	0.4	0.7	0.22	30min
SB96b	0.0056	3.584	3.2	3.6	2.5	1.8	3.6	1.00	1hr
SB97	0.0121	7.744	0.8	0.8	0.6	0.8	0.8	0.10	30min
SB98	0.0249	15.936	4.8	5.5	3.7	2.6	5.5	0.35	1hr
SB99	0.0235	15.04	5.2	6	4	2.8	6	0.40	1hr
Shed DET	0.038	24.32	5.1	6.1	6.2	6.3	6.3	0.26	6hr
Shed Jct	0.038	24.32	24.4	26.9	17.1	11.9	26.9	1.11	1hr
Sink-1East	0.0417	26.688	5.6	6.4	4.3	3.1	6.4	0.24	1hr
Sink-1Northe	1.153384	738.1658	249.8	291.7	241.5	205.6	291.7	0.40	1hr
Sink-3	0.2688	172.032	73.2	83.1	60.4	43.8	83.1	0.48	1hr
Sink110	0.40816	261.2224	55.4	64.2	54.4	50.3	64.2	0.25	1hr
Sink113	0.848959	543.3338	309.2	358.7	277.6	212.6	358.7	0.66	1hr
Sink117	0.2368	151.552	35.6	40.7	28.5	30.8	40.7	0.27	1hr
Sink126	0.0872	55.808	14.7	16.7	12	12.5	16.7	0.30	1hr
Sink1300E	0	0	13	13	13	13	13		
Sink1305	0.117899	75.45536	60.5	67.7	47.5	33.9	67.7	0.90	1hr
Sink1306	0.2132	136.448	32.1	36.8	30.8	26.7	36.8	0.27	1hr
Sink131	0.0933	59.712	22.1	25.6	17.8	15.3	25.6	0.43	1hr
Sink138	0.0672	43.008	32.9	36.9	23.6	17	36.9	0.86	1hr
Sink1404	0.072	46.08	17	19.5	13.6	10.8	19.5	0.42	1hr
Sink1404b	0.0833	53.312	14	16	11.8	9.8	16	0.30	1hr
Sink147	0.19127	122.4128	47.6	56.3	41.8	32.4	56.3	0.46	1hr
Sink1703	0.0092	5.888	1.9	2.2	1.6	1.2	2.2	0.37	1hr
Sink2101	0.1629	104.256	55.2	62.5	41.6	35.9	62.5	0.60	1hr
Sink2102	1.4067	900.288	55.1	64.8	56.9	54	64.8	0.07	1hr
Sink234	0.2222	142.208	22.2	25.2	21.3	27.4	27.4	0.19	6hr
Sink3101	0.1363	87.232	74.2	83.5	56.3	47.1	83.5	0.96	1hr
Sink3104	0.0841	53.824	64.9	71.7	44.2	32.3	71.7	1.33	1hr
Sink3203	0.061	39.04	56.7	62.6	38.4	27	62.6	1.60	1hr
Sink338	0.0649	41.536	25.8	27.7	16.8	11.7	27.7	0.67	1hr
Sink372	0.3099	198.336	49.5	56.7	40.4	30.5	56.7	0.29	1hr
Sink389	0.0179	11.456	3.1	3.6	2.5	1.8	3.6	0.31	1hr
Sink393	0.0449	28.736	6.7	7.7	5.3	4.3	7.7	0.27	1hr
Sink420	0.302	193.28	28.3	39.8	47	51.8	51.8	0.27	6hr
Sink473	0.2074	132.736	30.2	34.7	24.7	20.1	34.7	0.26	1hr
Sink497	0.0744	47.616	12.1	14	10.1	11.4	14	0.29	1hr
Sink509	0.1021	65.344	12.6	14.4	10.4	9.9	14.4	0.22	1hr
Sink514	1.9683	1259.712	158	195.5	179.6	148.8	195.5	0.16	1hr
Sink518	0.1816	116.224	90.5	102.6	70.4	51.5	102.6	0.88	1hr
Sink526	0.0726	46.464	58	62.5	36.5	25.7	62.5	1.35	1hr
Sink528	0.1119	71.616	52.9	57.3	35.7	25	57.3	0.80	1hr
Sink529	0.1677	107.328	83.9	91	55.4	48.4	91	0.85	1hr
Sink540	0.4342	277.888	153.3	181.4	150.6	127.2	181.4	0.65	1hr
Sink541	0.1382	88.448	82.5	90.6	58.1	41.6	90.6	1.02	1hr
Sink554	0.1867	119.488	104	112.1	65.4	45	112.1	0.94	1hr
Sink562	0.2028	129.792	43.7	49	32.4	29.5	49	0.38	1hr
Sink667	0.4482	286.848	70.3	80.3	58.1	44.5	80.3	0.28	1hr
Sink98	0.2356	150.784	48	54.9	37	26.1	54.9	0.36	1hr
S Pump V	0.06823	43.6672	5.9	7.3	7.8	8.3	8.3	0.19	6hr
USB17	0.01	6.4	1.9	1.9	1.9	1.9	1.9	0.30	30min
USB28	0.0142	9.088	1.8	2.2	2.2	2	2.2	0.24	1hr
USB29	0.0043	2.752	0.4	0.5	0.4	0.4	0.5	0.18	1hr

			Existing Peak Discharge				Peak Flow		
Element ID	Area	Area	10yr 30min	10yr 1hr	10yr 3hr	10yr 6hr	Existing	Existing/acre	Peak Storm
	mi^2	acres	cfs	cfs	cfs	cfs	cfs	cfs/ac	
USB31	0.0218	13.952	4.2	4.2	4.2	4.2	4.2	0.30	30min
USB413	0.0166	10.624	2.3	2.8	2.9	2.8	2.9	0.27	3hr
USB51	0.0194	12.416	2.9	3.7	3.7	3.7	3.7	0.30	1hr
USB615	0.0074	4.736	1.4	1.4	1.4	1.4	1.4	0.30	30min
USB619	0.0049	3.136	0.9	0.9	0.9	0.9	0.9	0.29	30min
USB621	0.0228	14.592	3.1	3.8	3.9	3.8	3.9	0.27	3hr
USB622	0.0152	9.728	2.4	2.9	2.9	2.9	2.9	0.30	1hr
USB630	0.024	15.36	3.6	4.5	4.6	4.6	4.6	0.30	3hr
USB632	0.0157	10.048	2.5	3	3	3	3	0.30	1hr
USB634	0.0241	15.424	3.1	3.2	3.2	3.2	3.2	0.21	1hr
Vine	0.00056	0.3584	0.5	0.5	0.2	0.2	0.5	1.40	30min
VineSteeple	0.00056	0.3584	0.6	0.5	0.2	0.2	0.6	1.67	30min
VW1300	1.056284	676.0218	260	299.3	230.2	192.6	299.3	0.44	1hr
WEST	0	0	7.3	8.1	8.7	9.2	9.2		
WestDETR	0.06823	43.6672	5.9	7.3	7.8	8.3	8.3	0.19	6hr
West DET	0.06823	43.6672	5.9	7.3	7.8	8.3	8.3	0.19	6hr
500W	0.00506	3.2384	7.6	6.4	3	2	7.6	2.35	30min
500 W south	0.01763	11.2832	18.2	18.7	9.9	6.5	18.7	1.66	1hr

MURRAY
CITY COUNCIL

New Business Item #2

MURRAY

Mayor's Office

Ordinance Modifications Pertaining to Court Administrator Position

Council Action Request

Council Meeting

Meeting Date: February 19, 2019

Department Director
Mayor Blair Camp

Phone #
801-264-2600

Presenters
G.L. Critchfield

Required Time for Presentation

Is This Time Sensitive
Yes

Mayor's Approval

Date
February 6, 2019

Purpose of Proposal

Approval of ordinance modifications pertaining to the Court Administrator position and associated job duties

Action Requested

Approval of ordinance

Attachments

Proposed ordinance

Budget Impact

Savings to the general fund of $40,000 in FY2019, and $135,000 in FY2020

Description of this Item

The recent retirement of our court administrator has provided an opportunity to evaluate the division of job duties in the court. During discussions with Mike Williams prior to his retirement, he indicated that the court is operating smoothly and technological advances have lightened the previously heavy workload.

I am recommending that the Justice Court Judge assume the budgetary responsibilities of the court. I am also recommending that a Senior Court Clerk position be established to handle supervision of staff and day-to-day administrative operations.

ORDINANCE NO. _____

AN ORDINANCE AMENDING SECTIONS 2.09.080, 2.09.150 AND 2.09.160 OF THE MURRAY CITY MUNICIPAL CODE REMOVING REFERENCES TO A JUSTICE COURT ADMINISTRATOR

BE IT ENACTED BY THE MURRAY CITY MUNICIPAL COUNCIL:

Section 1. Purpose. The purpose of this ordinance is to amend sections 2.09.080, 2.09.150 and 2.09.160 of the Murray City Municipal Code relating to a justice court administrator.

Section 2. Amend sections 2.09.080, 2.09.150 and 2.09.160. Sections 2.09.080, 2.09.150 and 2.09.160 of the Murray City Municipal Code shall be amended as follows:

2.09.080: JUDGE RESPONSIBILITIES:

. . .

B. The Justice Court Judge must appropriately apply the law without regard to any budgetary or revenue concerns. Although the Justice Court Judge has ultimate administrative and adjudicative responsibilities for the Justice Court, he or she does not report to the Mayor. ~~Administrative matters, including the Justice Court budget, have been delegated to the Justice Court Administrator, who is accountable to the Mayor, pursuant to section 2.09.160 of this chapter.~~ The Justice Court Judge manages the Justice Court budget.

. . .

2.09.150: CLERICAL PERSONNEL AND JUSTICE COURT STAFF AND RESOURCES:

A. The City provides and compensates clerical personnel ~~and a Court Administrator~~ to conduct the business of the Justice Court, under the City's general staffing plan.

1. The selection, supervision, and discipline of court clerical and quasi-judicial personnel, as well as day to day administrative operations, is managed by the ~~Justice Court Administrator~~ Senior Court Clerk ~~and~~ in accordance with City human resource policies.

. . . .

~~**2.09.160: ADMINISTRATOR:**~~

~~A. There is a Court Administrator for the Justice Court whose responsibilities include preparing the Justice Court budget, presenting the Justice Court budget to the City Council, managing Justice Court personnel in accordance with City human resource policies and procedures, and in general managing the administrative matters of the Justice Court.~~

~~B. The Court Administrator reports directly to the Mayor. (Ord. 16-17)~~

Section 3. Effective date. This Ordinance shall take effect upon first publication.

PASSED, APPROVED AND ADOPTED by the Murray City Municipal Council on this ____ day of _____, 2019.

MURRAY CITY MUNICIPAL COUNCIL

_____
, Chair

ATTEST:

_____
Jennifer Kennedy, City Recorder

MAYOR'S ACTION: Approved

DATED this ____ day of _____, 2019.

_____
D. Blair Camp, Mayor

ATTEST:

_____
Jennifer Kennedy, City Recorder

CERTIFICATE OF PUBLICATION

I hereby certify that this Ordinance, or a summary hereof, was published according to

law on the ___ day of _____, 2019.

_____
Jennifer Kennedy, City Recorder

MURRAY
CITY COUNCIL

New Business Item #3

MURRAY

Mayor's Office

Ordinance Modifications Pertaining to the ADS Department

Council Action Request

Council Meeting

Meeting Date: February 19, 2019

Department Director Mayor Blair Camp **Phone #** 801-264-2600 **Presenters** G.L. Critchfield **Required Time for Presentation** **Is This Time Sensitive** Yes **Mayor's Approval**  **Date** February 7, 2019	**Purpose of Proposal** Approval of the proposed ordinance modifications related to restructuring the ADS Department **Action Requested** Approval of ordinance **Attachments** Ordinance **Budget Impact** Savings to the general fund of $65,000 IN FY2019, and $255,000 in FY2020 **Description of this Item** The recent resignation of the administrative and development services director has provided an opportunity to evaluate the department structure. The attached ordinance outlines the proposed changes. This item was discussed in committee of the whole on Feb. 5. The ordinance modifications requested by committee members have been incorporated into the attached document.

ORDINANCE NO. _____

AN ORDINANCE AMENDING CHAPTERS 2.11 AND 2.20, AND SECTIONS 2.24.010, 2.32.050, 2.47.010, 2.50.040, 2.54.060, 2.56.050, 2.56.060, 2.56.070, 2.56.100, 2.56.120, 2.62.020, 3.04.010, 3.04.055, 3.04.070, 3.04.150, 3.04.160, 3.04.170, 3.04.200, 3.04.250, 3.10.080, 3.10.090, 3.10.110, 3.10.410, 3.52.040, 3.54.040, 5.04.030, 8.16.050, 8.24.030, 12.28.030, 12.28.040, 12.28.050, 12.30.010, 12.34.050, 13.04.040, 13.04.070, 15.20.260, 17.16.010 AND ENACTING CHAPTER 2.26 **OF THE MURRAY CITY MUNICIPAL CODE RELATING TO THE REORGANIZATION OF CITY DEPARTMENTS**

BE IT ENACTED BY THE MURRAY CITY MUNICIPAL COUNCIL:

Section 1. Purpose. The purpose of this ordinance is to amend chapters 2.11 and 2.20, and sections 2.24.010, 2.32.050, 2.47.010, 2.50.040, 2.54.060, 2.56.050, 2.56.060, 2.56.070, 2.56.100, 2.56.120, 2.62.020, 3.04.010, 3.04.055, 3.04.070, 3.04.150, 3.04.160, 3.04.170, 3.04.200, 3.04.250, 3.10.080, 3.10.090, 3.10.110, 3.10.410, 3.52.040, 3.54.040, 5.04.030, 8.16.050, 8.24.030, 12.28.030, 12.28.040, 12.28.050, 12.30.010, 12.34.050, 13.04.040, 13.04.070, 15.20.260, 17.16.010 and enact chapter 2.26 **of the Murray City Municipal Code relating to reorganization of City departments.**

Section 2. Amendments. **C**hapters 2.11 and 2.20, and sections 2.24.010, 2.32.050, 2.47.010, 2.50.040, 2.54.060, 2.56.050, 2.56.060, 2.56.070, 2.56.100, 2.56.120, 2.62.020, 3.04.010, 3.04.055, 3.04.070, 3.04.150, 3.04.160, 3.04.170, 3.04.200, 3.04.250, 3.10.080, 3.10.090, 3.10.110, 3.10.410, 3.52.040, 3.54.040, 5.04.030, 8.16.050, 8.24.030, 12.28.030, 12.28.040, 12.28.050, 12.30.010, 12.34.050, 13.04.040, 13.04.070, 15.20.260, 17.16.010 of the Murray City Municipal Code shall be amended to read as follows:

Chapter 2.11
~~ADMINISTRATIVE~~ COMMUNITY AND ECONOMIC DEVELOPMENT ~~SERVICES~~ DEPARTMENT

2.11.010: ESTABLISHED:

A. The ~~Administrative~~ Community and Economic Development ~~Services~~ Department is created. A director of the ~~Administrative~~ Community and Economic Development ~~Services~~ Department is appointed by the Mayor, subject to the advice and consent of the City Council. The director shall be a department director and reports to the Mayor. ~~Pursuant to section 2.48.010 of this title, the director has been designated by the Mayor to serve as executive director of the Redevelopment Agency of Murray City (RDA). The director, as the designated RDA executive director, shall perform duties as directed by the RDA board of trustees.~~

B. The ~~Administrative and~~ Community and Economic Development ~~Services~~ Department is divided into the ~~following divisions:~~ Building ~~Inspection~~ Division and the

Planning Division~~; Community and Economic Development Division; Geographic Information System (GIS) Division; Information Technology (IT) Division; Recorder Division; and Treasurer Division~~.

2.11.020: BUILDING ~~INSPECTION~~ DIVISION:

A. The Building ~~Inspection~~ Division is created. The Division is managed by a chief building official who reports to the director of the ~~Administrative~~ Community and Economic Development ~~Services~~ Department. The Division responsibilities include:

1. Reviewing building construction plans for compliance with adopted building codes;
2. Issuing building permits;
3. Inspecting new and altered buildings for compliance with adopted building codes;
4. Issuing certificates of occupancy for new and altered buildings; and
5. Performing related functions as determined by the director of the ~~Administrative~~ Community and Economic Development ~~Services~~ Department.

. . . .

2.11.030: ~~COMMUNITY AND ECONOMIC DEVELOPMENT~~ PLANNING DIVISION:

A. The ~~Community and Economic Development~~ Planning Division is created. The Division is managed by a planning division manager, who reports to the director of the ~~Administrative~~ Community and Economic Development ~~Services~~ Department.

B. The ~~Community and Economic Development~~ Division shall promote and provide for the orderly coordination, planning, development and growth of the community and economy of the City; encourage the elimination of blight and decay; assist in redevelopment activities; foster an attractive, clean and healthful community environment for all City residents, workers and visitors; enforce the City's zoning requirements; and serve as staff to the City's planning and zoning commission, appeal authority and other committees/advisory boards associated with land use issues.

C. The ~~Community and Economic Development~~ Division works to develop the City's long range plans, including policy and land use plans; administers applicable land use laws, codes, ordinances and related regulations, such as future land use plans, zoning ordinances, subdivision regulations and building and housing codes; and coordinates with the City Attorney's office in the enforcement of laws, codes, ordinances and regulations.

D. The Division shall administer the City business license ordinance; issue alcohol beverage sales and licenses, and assess and collect fees for these services.

E. The Division shall perform related functions as determined by the director of the ~~Administrative~~ Community and Economic Development ~~Services~~ Department. (Ord. 16-17)

2.11.040: GEOGRAPHIC INFORMATION SYSTEM (GIS) DIVISION:

A. The Geographic Information System (GIS) Division is created. The Division is managed by a GIS supervisor, who reports to the director of the Administrative and Development Services Department.

B. The Division is responsible for the design, implementation and maintenance of geographic information systems including database design and system interface.

C. The Division shall perform related functions as determined by the director of the Administrative and Development Services Department. (Ord. 16-17)

2.11.050: INFORMATION TECHNOLOGY (IT) DIVISION:

A. The Information Technology (IT) Division is created. The Division is managed by a network administrator and a senior programmer, who reports to the director of the Administrative and Development Services Department.

B. The Division is responsible for all City computer network planning, administration and operation activities; performing installation and maintenance for computer network and communication systems hardware and software; maintaining servers; providing internet security; and performing other duties as directed by the director of the Administrative and Development Services Department. (Ord. 16-17)

2.11.060: RECORDER DIVISION:

A. The Recorder Division is created. The Division is directed by a City Recorder, who reports to the director of the Administrative and Development Services Department.

B. The responsibilities of the Recorder Division include:
1. Keeping and preserving all official records of the City;
2. Keeping records of the official proceedings of the City as required by law;
3. Attending the meetings and maintaining the official record of the proceedings of the City Council;
4. Maintaining the corporate seal and attesting all legal documents of the City;
5. Countersigning all contracts made on behalf of the City and maintaining an indexed record of all City contracts;
6. Notifying the director of the Administrative and Development Services Department and the City Attorney's office of any real property transactions in which the City has an interest;
7. Conducting and supervising all City elections as provided by law;
8. Maintaining an inventory of all real property owned by the City;
9. Maintaining records of transactions relating to real property owned by the City, and records and preserves real property deeds and related abstracts of title and title insurance policies relating to those transactions;

~~10. Administering the procurement process and procedures of the City in accordance with applicable state and City law;~~
~~11. Supervising the maintenance and physical plant operations of the City's facilities and grounds; and~~
~~12. Performing related functions as determined by the director of the Administrative and Development Services Department. (Ord. 16-17)~~

~~2.11.070: TREASURER DIVISION:~~

~~A. The Treasurer Division is created. The Division is managed by the City Treasurer, who reports to the director of the Administrative and Development Services Department.~~

~~B. The responsibilities of the Treasurer Division include:~~
~~1. Supervising the collection of all taxes, assessments, fines, forfeitures, service charges, intergovernmental revenue, licenses, fees and other revenues of the City, as provided for by applicable laws and ordinances;~~
~~2. Providing for the investment of cash in accordance with the Uniform Fiscal Procedures Act and Utah Money Management Act;~~
~~3. Disposing and disbursing funds of the City, subject to budget appropriations;~~
~~4. Maintaining an accounting of all transactions, receipts, disbursements and other matters as provided in the Uniform Fiscal Procedures Act and Utah Money Management Act and as the City may by ordinance or resolution direct;~~
~~5. Recording the bonds of the statutory officers of the City as required by state law;~~
~~6. Executing all checks of the City prepared by the City Finance Department as provided by state law;~~
~~7. Overseeing the utility customer service activities of the City. These activities include reading utility meters, generating utility bills and maintaining utility accounts receivable, accounts payable and collections accounts; and~~
~~8. Performing such other duties as directed by the director of the Administrative and Development Services Department. (Ord. 16-17)~~

. . .

Chapter 2.20
FINANCE AND ADMINISTRATION DEPARTMENT

2.20.010: DEPARTMENT CREATED; ROLE AND MISSION:

A. The Finance and Administration Department is created. The Department is directed by the Director of Finance and Administration ~~Department director~~, who reports to the Mayor ~~and the City Council when serving as the City's budget officer~~.

~~B. The Finance Department provides timely completion of financial functions, including accounting, budgeting, payroll and custody of City funds; and does so in compliance with federal, state and local laws and with generally accepted accounting practices and principles.~~

B. The position of Budget Officer is held by the Mayor or a city officer in the Finance and Administration Department appointed by the Mayor with the advice and consent of the City Council. The Budget Officer provides reports to the City Council as required by the Uniform Fiscal Procedures Act for Utah Cities.

C. The purpose of the Department is to provide financial and administrative services to the City. These include the management, performance, and reporting of the City's budget, accounting, finance, treasury, personnel, compensation, benefits, records, billing, audit, and purchasing services; and does so in compliance with federal, state and local laws and with generally accepted accounting practices and principles.

~~C~~D. The Finance Department responsibilities include:
1. Working with the City Council in preparing the City's budget;
2. Coordinating the preparation, evaluation and monitoring of the City's operating and capital budgets, subject to the final review and adoption by the Mayor and City Council. This budget function includes providing:
a. Supporting revenue and expenditure analysis and projections;
b. Aid in developing, coordinating and monitoring capital improvement programs;
c. Administrative and fiscal policy analysis; and
d. Coordination of the acquisition and management of all federal, state, and other intergovernmental grants and revenues acquired by the City;
~~3. Preparing City payrolls; and~~
~~4. Serving as City auditor and performing all of the financial duties and responsibilities of the City auditor as established by applicable state law.~~

E. The Department is divided into the following divisions: Accounting Division, Recorder Division, Utility Billing Division and Human Resource Division.

2.20.020: ACCOUNTING DIVISION

A. The Accounting Division is created. The Division is managed by a Controller, who reports to the Director of Finance and Administration.

B. The City Treasurer shall be appointed by the Mayor with the advice and consent of the City Council. The City Treasurer reports to the Controller and works under the Accounting Division.

C. The Accounting Division is responsible for the following functions:

1. Complying with all federal, state, and local laws and with generally accepted accounting practices and principles with regard to the administration of the City's accounting and financial management;

2. Maintaining the City's financial accounting system;

3. Providing financial reports to the City Council, Mayor, and department directors as required by the Uniform Fiscal Procedures Act;

4. Administering payroll and all related reports and reconciliations;

5. Controlling cash management while managing investments in accordance with the Utah Money Management Act.

6. Providing a system of internal controls for the protection of the City's assets.

7. Participating with the independent audit and performing internal audits; and

8. Performing related functions as determined by the Director of Finance and Administration.

2.20.030: RECORDER DIVISION

A. The Recorder Division is created. The Division is managed by the City Recorder, who reports to the Director of Finance and Administration.

B. The City Recorder is the City's Election Official and the City's Records Officer.

C. The responsibilities of the Recorder Division include:

1. Keeping and preserving all official records of the City, including but not limited to ordinances, resolutions, contracts, deeds, and titles;

2. Attending the meetings and maintaining the official record of the proceedings of the meeting;

3. Maintaining the corporate seal and attesting all legal documents of the City;

4. Countersigning all contracts made on behalf of the City and maintaining an indexed record of all City contracts;

5. Conducting and supervising all City elections as provided by law;

6. Administering the procurement process and procedures of the City in accordance with applicable with state and local law; and

7. Performing related functions as determined by the Director of Finance and Administration.

2.20.040: UTILITY BILLING DIVISION

A. The Utility Billing Division is created. The Division is managed by a Utility Billing Supervisor, who reports to the Director of Finance and Administration.

B. The responsibilities of the Utility Billing Division include:

1. Preparing and generating invoices for service on a regular billing cycle for all utility services provided by the City;

2. Creating and maintaining all utility accounts;

3. Maintaining and reconciling the utility receivable, payable, and collection accounts;

4. Generating reports and performing internal audits of utility accounts and usage;

5. Creating requests for service for utility meters and collaborating with Public Works and Power Departments to compete the work;

6. Acting as the primary contact for customer service for the City; and

7. Performing such other duties as directed by the Director of Finance and Administration.

2.20.050: HUMAN RESOURCE DIVISION

A. The Human Resource Division is created. The Division is managed by a Human Resource Manager, who reports to the Director of Finance and Administration.

B. The Human Resource Manager is the City's Equal Employment Opportunity (EEO) Officer in accordance with federal, state, and local laws and guidelines. The EEO Officer reviews and resolves all claims of discrimination.

C. The responsibilities of the Human Resource Division include:

1. Administrating all personnel functions of the City including but not limited to wage and salary administration, recruitment, testing and selection, fringe benefit administration, position classification, organizational analysis, personnel records management, and employee training;

2. Providing staff support to the Personnel Advisory Board which is the Employee Appeals Board under Utah State Code §10-3-1106; and

3. Performing such other duties as directed by the Director of Finance and Administration.

~~Chapter 2.23~~
~~HUMAN RESOURCE DEPARTMENT~~

~~2.23.010: DEPARTMENT CREATED; DUTIES:~~

~~The Human Resource Department is created. The Department shall be directed by the Human Resource Director, a department director who reports to the Mayor and is responsible for the administrative direction of the Human Resource Department. The Human Resource Director is appointed by the Mayor with the advice and consent of the City Council. The Human Resource Department performs the following functions:~~

~~A. Administration Of All Personnel Functions: The Human Resource Department is responsible for the administration of all personnel functions of the City, including, but not limited to, employee recruiting and certification, employee classification and evaluation, administration of employee benefits, including health insurance, wage and compensation plans, labor relations, employment training, equal opportunity employment, employee grievances, providing staff to the personnel advisory board and maintenance of all City personnel records.~~

~~B. Equal Employment Opportunity (EEO) Officer: The function of the Equal Employment Opportunity officer is assigned to the Human Resource Director. The EEO officer is responsible for developing and monitoring equal employment opportunity throughout the City in accordance with applicable federal, state and City laws and guidelines. The EEO officer shall review and resolve claims of discrimination in violation of federal, state and local law.~~

~~C. Discontinuance Of The Civil Service Commission: Pursuant to section 10-3-1001 of the Utah Code, the City shall, as of November 19, 2008, discontinue its Civil Service Commission for employees in its Police and Fire Departments. The employment, testing, hiring, promotion, and discipline of employees shall be governed by the general statutory requirements of title 10, chapter 3, part 11 of the Utah Code and applicable rules and regulations adopted by the Mayor.~~

~~D. Personnel Advisory Board: The Human Resource Department provides staff to support the Personnel Advisory Board in fulfilling its duties. The Personnel Advisory Board is the Employee Appeals Board under section 10-3-1106 of the Utah Code. (Ord. 16-17)~~

Chapter 2.24
PARKS AND RECREATION DEPARTMENT

2.24.010: ESTABLISHED; ROLE AND MISSION:

. . .

D. The Parks and Recreation Director shall supervise the maintenance and physical plant operations of the City's facilities and grounds.

. . . .

Chapter 2.32
PUBLIC WORKS DEPARTMENT

. . .

2.32.050: WATER DIVISION:

A. The Water Division of the Public Works Department is created. The division shall be directed by the Water Superintendent, who reports to the Public Works Director. The division is responsible for:

1. The acquisition, transportation, storage, treatment and distribution of all raw and potable water for the City and its designated service areas; ~~and~~

2. The collection and disposal of all wastewater and sewage generated within the City or its designated service areas~~.~~; and

3. Reading utility meters.

. . . .

Chapter 2.47
ETHICS COMMISSION

2.47.010: COMMISSION ESTABLISHED; PURPOSE, COMPOSITION; APPOINTMENT; TERM:

. . .

H. Compensation: Members may not receive compensation or benefits for the member's service; except that a member may receive per diem and expenses incurred in the performance of the member's official duties at the rates established by the ~~City~~ Finance and Administration Department.

. . . .

Chapter 2.50
SHADE TREE AND BEAUTIFICATION COMISSION

. . .

2.50.040: POWERS AND DUTIES GENERALLY:

. . .

G. To have the authority to accept gifts or bequests from any person or from any source, on behalf of the City and with the consent of the Mayor, for building improvements or maintenance of a civic arboretum, or for other programs sponsored by the Shade Tree and Beautification Commission. Monetary gifts or bequests shall be received by the ~~City~~ Director of Finance and Administration ~~Director~~ and shall be earmarked for the purposes donated, within the parameters set out above;

. . . .

Chapter 2.54
PUBLIC LIBRARY

. . .

2.54.060: LIBRARY FUND; DEPOSITS AND DISBURSEMENTS; GENERAL POWER AND AUTHORITY OF LIBRARY BOARD:

The City Council shall approve, subject to the recommendation of the Library Board, the expenditure of the library fund, and construction, lease, purchase or sale of library buildings and land. All tax funds received for the library shall be deposited to the credit of the library fund, and shall not be used for any purpose except that of the library. The library fund shall be used according to the procedures established by the ~~City~~ Director of Finance and Administration ~~Director~~. The Library Board shall be responsible for the operation, maintenance and care of the library. The Library Board shall establish rules and regulations for its operation. The Library Board shall, in general, carry out the intent of this chapter.

. . . .

Chapter 2.56
LOST, ABANDONED OR UNCLAIMED PROPERTY

. . .

2.56.050: NOTIFICATION OF CITY DEPARTMENTS

The Chief of Police shall also mail the above described list of all lost, abandoned or unclaimed property which is available for public sale to the Director of ~~City~~ Finance and Administration ~~Director~~. The ~~City~~ Director of Finance and Administration ~~Director~~ will then notify the other City departments of the property offered for public sale.

2.56.060: REQUESTS FOR USE OF PROPERTY BY CITY DEPARTMENTS:

If a City department wishes to utilize any of the lost, abandoned or unclaimed property offered for sale, then a written request stating which property is needed should be forwarded to the ~~City~~ Director of Finance and Administration ~~Director~~ not later than seven (7) days before the public sale.

2.56.070: JOINT COMMITTEE TO REVIEW REQUESTS; DESTRUCTION OF VALUELESS PROPERTY:

A joint committee comprised of an authorized representative appointed by the City Police Chief and an authorized representative appointed by the ~~City~~ Director of Finance and Administration ~~Director~~ shall then review departmental requests for the use of property and shall determine which department, if more than one request for the same property is received, shall be assigned the property. The remaining advertised property will then be offered for public sale on the published date. Provided, however, this joint committee may authorize the City Police Chief to destroy or otherwise dispose of any property subject to this chapter where such property is determined to be valueless or of such little value that the costs of conducting a sale and advertising would probably exceed the amount realized therefrom.

. . .

2.56.100: REPORT TO DIRECTOR OF FINANCE AND ADMINISTRATION ~~DIRECTOR~~ BY COMMITTEE:

The joint committee shall make a report to the Director of ~~City~~ Finance and Administration ~~Director~~, at the time of sale or disposition, containing a listing of any property sold or distributed under the provisions of this chapter, the amount of money received from public sales, and the fair market value, estimated by the joint committee, of any property distributed for use by a City department. (Ord. 16-17)

. . .

2.56.120: RECLAMATION BY OWNER:

If the owner, his legal representatives, or successors, of any lost, abandoned, or unclaimed property sold at auction or utilized by a City department, demands their property within seven (7) years from the date the property was received by the City Police Department, the ~~City~~ Director of Finance and Administration ~~Director~~ shall pay to them, after deducting the fees and expenses of the City in relation to the matter, the proceeds of the public sale; or, if the property was assigned to a City department, the fair market value of the property.

. . . .

Chapter 2.62
HUMAN RESOURCE POLICIES AND REGULATIONS

. . .

2.62.020: POSITIONS NOT IN CAREER OR PUBLIC SAFETY SERVICE:

A. The following regular full-time positions of employment in the City shall not be career service or public safety service:

. . .

2. The Mayor and the Mayor's staff, and the following appointed by the Mayor with the advice and consent of the City Council:

. . .

e. ~~Administrative and Development Services~~ Community and Economic Development Director,

f. Director of Finance and Administration ~~Director~~,

. . .

k. Public Works Director, ~~and~~

l. Parks and Recreation Director; and

m. Information Technology Director.

. . . .

Chapter 3.04
FINANCIAL ADMINISTRATION GENERALLY

3.04.010: FINANCIAL AFFAIRS OF CITY TO BE GOVERNED BY STATE LAW; ~~CITY FINANCE DIRECTOR DESIGNATED CITY~~ BUDGET OFFICER:

The City's financial matters shall be governed by and operated as provided in the Uniform Municipal Fiscal Procedures Act of the State. ~~The City Finance Director is the City Budget Officer.~~ The position of Budget Officer is held by the Mayor or a city officer in the Finance and Administration Department appointed by the Mayor with the advice and consent of the City Council. The Budget Officer provides reports to the City Council as required by the Uniform Fiscal Procedures Act for Utah Cities.

. . .

3.04.055: RESTRICTED PAYMENT AFTER TWO VIOLATIONS:

. . .

C. A tendering party who is notified that they are required to make payments in cash, cashier's check, money order, credit cards or debit cards shall have the right to appeal such requirement by filing a written appeal with the Director of Finance and Administration ~~Director~~ within thirty (30) days of being notified of such requirement, provided however, that the only grounds for appeal shall be a showing that the sole cause(s) underlying the dishonored payments that resulted in imposing the requirements of this section, are based on specific extraordinary or unforeseen circumstance(s). The ~~Finance~~ Director's decision regarding the appeal shall be final.

. . .

3.04.070: ELIGIBILITY FOR THE CITY'S LIMITED ASSISTANCE HEAT PROGRAM:

Individuals or families are eligible for limited funds from the City under the City's HEAT Program to be applied to their City utility bills as provided in this chapter if:

. . .

B. The individual or family, at the time of application, presents to the ~~City's~~ Director of Finance and Administration ~~Director~~ ("Director") or designee, written proof of eligibility under HEAT, to the satisfaction of the Director or designee, such as a copy of the HEAT voucher;

. . .

3.04.150: MUNICIPAL GRANTS; BUDGETING:

The ~~City~~ Finance and Administration Department shall each fiscal year designate and set aside funds in the General Fund budget for Municipal grants in an amount as follows:

. . .

3.04.160: MUNICIPAL GRANTS; SUBMISSION OF PROPOSALS:

Proposals for grants shall be submitted to the City through the Finance and Administration Department ~~of Administrative and Development Services~~. (Ord. 17-17)

3.04.170: MUNICIPAL GRANTS; PROPOSAL REVIEW:

A. After the proposals have been submitted, the ~~Department of Administrative and Development Services~~ Finance and Administration Department shall review the proposals and rank them in order of priority. In determining priority, it may consider the following:

. . .

B. The ~~Department of Administrative and Development Services~~ Finance and Administration Department shall then submit the ranked proposals, together with recommended funding levels, to the Council.

. . .

3.04.200: MUNICIPAL GRANTS; COMPLIANCE WITH CRITERIA:

Where a grant is based upon the condition that matching funds are required, the ~~Department of Administrative and Development Services~~ Finance and Administration Department shall require proof of the matching funds before disbursing the grant.

. . .

3.04.250: ECONOMIC DEVELOPMENT FUND; APPLICATION AND APPROVAL PROCESS:

. . .

D. Within fifteen (15) days from receipt, the Mayor will have the ~~City's~~ Finance and Administration, Public Works and Power Departments conduct an analysis of the application and submit the analysis to the Mayor's Office within thirty (30) days from the original application date. The analysis shall include, but not be limited to:

. . .

G. If the funds are approved by the City Council, the amount approved shall be allocated to a separate appropriation account on July 1 of the calendar year during which the application is received. Funds shall be disbursed to the applicant within thirty (30) days by the ~~City's~~ Director of Finance and Administration ~~Director~~ if there is evidence that the improvements specified by the City Council have been completed subject to limitations provided in subsection I of this section.

. . .

Chapter 3.10
PROCUREMENT

. . .

3.10.080: COMPETITIVE SEALED BIDS:

. . .

G. Award: The agreement shall be awarded by written notice to the lowest responsible and responsive bidder whose bid meets the requirements and criteria set forth in the invitation for bids. In the event the low responsive and responsible bid for a construction project exceeds available funds as certified by the Director of Finance and

Administration, and such bid does not exceed such funds by more than five percent (5%), the Purchasing Agent, or designee, is authorized, when time or economic considerations preclude resolicitation of work of a reduced scope, to negotiate an adjustment of the bid price with the low responsive and responsible bidder, in order to bring the bid within the amount of available funds. Any such negotiated adjustment shall be based only upon eliminating independent deductive items specified in the invitation for bids.

. . .

3.10.090: COMPETITIVE SEALED PROPOSALS:

. . .

F. Mandatory Selection Committee: All RFP or RFQ awards shall be made by a selection committee, which shall evaluate RFP or RFQ responses according to the evaluation factors required by subsection E of this section. The selection committee shall be comprised of no less than three (3) members. Not less than one (1) member shall represent the department to which the RFP or RFQ applies, and not less than one (1) member shall be the Purchasing Agent, or his/her designee. For RFPs or RFQs with an anticipated award amount of more than two hundred fifty thousand dollars ($250,000.00), not less than one (1) member shall represent the Finance and Administration Department. No member of any selection committee shall communicate or negotiate with any potential offeror, except in the presence of the entire selection committee.

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3.10.110: SMALL PURCHASES:

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C. Minimal Purchases; No Solicitation Process Required: Minimal or insignificant purchases are defined below. If such purchases are made without solicitation processes, they can only be made as stated below:

2. Purchases of professional services having a total value of not more than fifty thousand dollars ($50,000.00), but only when such purchase is approved in writing in advance by the department director, the Purchasing Agent and the Director of Finance and Administration ~~Director~~.

3. Except as provided in subsections F3 and F4 of this section, purchases of construction work, but not architectural and engineering services which are governed by section 3.10.420 of this chapter, having a total value of not more than twenty five thousand dollars ($25,000.00), but only when such purchase is approved in writing in

advance by the department director, the Purchasing Agent and the Director of Finance and Administration ~~Director~~.

D. Required Accounting Procedures: Any department making purchases under this section shall implement and follow accounting procedures that are acceptable to the ~~City's~~ Finance and Administration Department.

. . .

J. Small Purchase Agreement Modifications And Renewals: Any agreement solicited under this chapter shall only be modified or renewed as follows:

1. Modifications: Agreements shall not be modified in excess of the maximum dollar amounts stated in this chapter, unless this requirement is waived in writing by the Purchasing Agent and the Director of Finance and Administration ~~Director~~.

. . . .

3.10.410: PRIOR APPROVAL OF CONTRACT MODIFICATIONS:

Every agreement modification, change order, or agreement price adjustment in excess of the lesser of five percent (5%) or ten thousand dollars ($10,000.00) under a construction agreement with the City shall be subject to prior approval by the Purchasing Agent and the Director of Finance and Administration ~~Director~~, after receiving a report from the responsible department director as to the effect of the agreement modification, change order, or agreement price adjustment on the total project budget or the total agreement budget. (Ord. 17-14)

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Chapter 3.52
NO FAULT POWER DEPARTMENT CLAIMS

. . .

3.52.040: APPLICATION; INVESTIGATION AND RECOMMENDATION:

Applications for reimbursement received will be investigated and a recommendation for reimbursement will be made by the Power Department General Manager or designee and the City Attorney's Office or designee to the ~~City~~ Director of Finance and Administration ~~Director~~. All payments authorized will be made solely from funds set aside under this chapter. (Ord. 16-34)

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Chapter 3.54
NO FAULT WATER AND SEWER CLAIMS

. . .

3.54.040: APPLICATION; INVESTIGATION AND RECOMMENDATION:

Applications for reimbursement received will be investigated and a recommendation for reimbursement will be made by the Water Superintendent or designee and the City Attorney's Office or designee to the ~~City~~ Director of Finance and Administration ~~Director~~. All payments authorized will be made solely from funds set aside under this chapter. (Ord. 16-35)

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Chapter 5.04
BUSINESS LICENSES GENERALLY

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5.04.030: CITY LICENSE ADMINISTRATOR:

The City business license specialist is designated as the City License Administrator. The City License Administrator reports to and is under the direction of the ~~Community and Economic Development~~ Planning Division Manager. ~~Business licensing is administered by the Department of Administrative and Development Services~~. (Ord. 17-18)

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Chapter 8.16
NOISE CONTROL

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8.16.050: SPECIAL PERMIT:

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I. Appeal: Any determination made by the City Recorder relative to the issuance, denial or revocation of a permit hereunder may be appealed to the Director of Finance and Administration ~~Administrative and Development Services ("ADS") Department Director~~ by filing within ten (10) days from the date of said determination, a written notice of appeal setting forth the grounds for the appeal and any other pertinent information. Such notice of appeal shall be filed by delivering an original and three (3) copies to the ~~ADS Director~~ Director of Finance and Administration during regular business hours. Upon receipt of the appeal, the ~~ADS~~ Director of Finance and Administration ~~Director~~ shall thoroughly and objectively investigate the matter and issue a written decision stating the reasons for the decision and informing the appellant of any right to judicial review provided by law. (Ord. 17-25)

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Chapter 8.24
WEED CONTROL

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8.24.030: DEFINITIONS:

. . .

DEPARTMENT: The ~~Administrative~~ Community and Economic Development ~~Services~~ Department.

DIRECTOR: The Director of the ~~Administrative~~ Community and Economic Development ~~Services~~ Department.

. . . .

Chapter 12.28
LYNN F. PETT MURRAY PARKWAY GOLF COURSE

. . .

12.28.030: GREEN FEES:

The green fees shall be as follows:

User Type	9 Holes	18 Holes
10 round punch card	$130 .00	n/a
Juniors	8 .00	$16 .00
Juniors annual pass (age 17 or younger)	300 .00	
Murray High School and Cottonwood High School golf teams	6 .00	12 .00
Other high school golf teams	8 .00	16 .00
Regular	15 .00	30 .00
Seniors (age 60 or older)	12 .00	24 .00

All rates above include applicable Sales and Use Tax and are available during times as determined in writing by the Parks and Recreation Director, the Mayor, and the Director of Finance and Administration ~~Director~~. (Ord. 18-06: Ord. 17-30)

12.28.040: GOLF COURSE OPERATION; RENTALS:

Rental fees shall be as follows:

Rental Types	9 Holes	18 Holes
Golf clubs	$6 .00	$12 .00
Pull cart	1 .00	2 .00
Range ball tokens	3 .00	
Riding carts (per person)	7 .00	14 .00
Trail fee for private carts used for medical reasons	7 .00	14 .00

All rates above include applicable Sales and Use Tax and are available during times as determined in writing by the Parks and Recreation Director, the Mayor, and the Director of Finance and Administration ~~Director~~. (Ord. 18-06: Ord. 17-30)

12.28.050: DISCOUNTS AND PROMOTIONS:

A. From time to time the City is authorized to offer discounts and promotions at the Lynn F. Pett Murray Parkway Golf Course as long as the discounts and promotions are first approved in writing by the Parks and Recreation Director, the Mayor and the Director of Finance and Administration ~~Director~~; provided, however, that no such discounts or promotions shall be in violation of section 10-8-2 of the Utah Code, and that, at a minimum, all such discounts or promotions shall cover the costs of running the discounts or promotions.

. . . .

Chapter 12.30
FEES FOR THE PARK CENTER IN MURRAY

12.30.010: FEES:

. . .

K. Fees for miscellaneous services, including facility rental, locker rental, merchandise sales, classes and programs and special events, shall be established by the Parks and Recreation Director pursuant to a written schedule, provided, however, that such fees ~~must~~ shall not be more than necessary to recoup the City's cost for the services charged. ~~From time to time, the City is authorized to offer discounts and promotions as long as the discounts and promotions are first approved in writing by the Parks and Recreation Director, the Mayor and the Director of Finance; provided, however, that no such discounts or promotions shall be in violation of section 10-8-2 of the Utah Code, and that, at a minimum, all such discounts or promotions shall cover the costs of running the discounts or promotions. (Ord. 18-06: Ord. 17-05)~~

L. From time to time, the City is authorized to offer discounts and promotions as long as the discounts and promotions are first approved in writing by the Parks and Recreation Director, the Mayor and the Director of Finance and Administration; provided, however, that no such discounts or promotions shall be in violation of section 10-8-2 of the Utah Code, and that, at a minimum, all such discounts or promotions shall cover the costs of running the discounts or promotions. (Ord. 18-06: Ord. 17-05)

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Chapter 12.34
SPECIAL EVENTS

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12.34.050: PERMIT; APPLICATION PROCEDURES:

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D. Upon receipt of a special event permit application, the City Recorder shall circulate copies of the application to Salt Lake County and the following county agencies and City departments, as applicable, for the purpose of obtaining their approval or disapproval of the proposed special event:

1. Salt Lake ~~Valley~~ County Health Department;

. . .

6. ~~Administrative and Development Services~~ Community and Economic Development Director;

. . . .

Chapter 13.04
UTILITY SERVICES GENERALLY

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13.04.040: ACCOUNT BILLING:

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D. Late Payment Charge:

1. After twenty five (25) days from the billing statement date, a late payment charge of 1.5 percent shall be assessed against any unpaid delinquent balance. A customer may be granted a waiver of the late payment charge if:

a. The customer makes a written request with the Director of ~~f~~Finance and Administration or designee within thirty (30) days from assessment of the late payment charge;

b. The customer has incurred no late payment charges on their account in the twelve (12) consecutive months prior to the assessment of the late payment charge the customer wants waived;

c. The ~~finance~~ Director of Finance and Administration or designee has determined that good cause exists to waive the late payment charge.

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13.04.070: INFORMAL REVIEW:

Subject to the provisions of subsection 13.04.060F1 of this chapter, any person who is unable to resolve a dispute with a ~~c~~City utility concerning a matter addressed in this chapter may obtain informal review of the dispute by a designated employee within the ~~d~~Department of ~~f~~Finance and ~~a~~Administration. Such employee shall investigate the dispute, make an attempt to resolve it, and inform both the city utility and the customer of his/her findings within five (5) business days from receipt of the informal review request. The ~~d~~Department of ~~f~~Finance and ~~a~~Administration shall in all cases inform the customer of his/her right to petition the hearing officer for a formal review of the dispute, and shall make available to the customer a standardized complaint form with instructions. While an account holder is proceeding with an informal or a formal review of a dispute, no termination of service shall be permitted, provided any amounts not disputed are paid when due. (Ord. 94-20 § 1: Ord. 91-34 § 1: prior code § 10-55.7)

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Chapter 15.20
ELECTRICAL REGULATIONS

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15.20.260: POWER FUND FINANCIAL STANDARDS:

In order to maintain fiscal soundness of the power fund, the following financial standards are established:

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B. Transfer For Administrative Services: Transfer for administrative services to the general fund must be in an amount not to exceed the value of the actual services rendered. Such amount will be set each year by the ~~City~~ Director of Finance and Administration ~~Director~~ and approved by the City Council through the budget approval process, based upon established cost allocation methodologies. In the general audit for

fiscal year 1994-1995, and every fifth year thereafter, an allocation audit will be included in the general audit performed for the City by an independent auditor, to verify and/or recommend modification of the cost allocation methodologies. Any additional costs must be paid out of an appropriate Power Department account.

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Chapter 17.16
APPEAL AUTHORITY

17.16.010: DEFINITIONS:

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LAND USE AUTHORITY: The ~~p~~Planning ~~c~~Commission, the ~~administrative~~ Community and Economic ~~d~~Development ~~services~~ ~~d~~Director, or a staff member of the ~~community and economic development~~ Planning Division when making any order, requirement, decision or determination in the enforcement of title 16 or 17 of this code, or any other related ordinance. (Ord. 14-10)

. . . .

Section 3. Enactment. Chapter 2.26 of the Murray City Municipal Code shall be enacted to read as follows:

CHAPTER 2.26
INFORMATION TECHNOLOGY (IT) DEPARTMENT

2.26.010: ESTABLISHED:

A. The Information Technology (IT) Department is created. A director of the IT Department is appointed by the Mayor, subject to the advice and consent of the City Council. The director shall be a department director and reports to the Mayor.

B. The IT Department is divided into the following divisions: IT division and Geographic Information System (GIS) division.

2.26.020: INFORMATION TECHNOLOGY (IT) DIVISION:

A. The Information Technology (IT) Division is created. The Division is managed by the director of the IT Department.

B. The Division is responsible for all City computer network planning, administration and operation activities; performing installation and maintenance for computer network and communication systems hardware and software; maintaining servers; providing internet security; and performing other duties as directed by the director of the IT Department.

2.26.030: GEOGRAPHIC INFORMATION SYSTEM (GIS) DIVISION:

A. The Geographic Information System (GIS) Division is created. The Division is managed by a GIS supervisor, who reports to the director of the IT Department.

B. The Division is responsible for the design, implementation and maintenance of geographic information systems including database design and system interface.

C. The Division shall perform related functions as determined by the director of the IT Department.

Section 4. Effective date. This Ordinance shall take effect upon first publication.

PASSED, APPROVED AND ADOPTED by the Murray City Municipal Council on this ____ day of _____, 2019.

MURRAY CITY MUNICIPAL COUNCIL

_____
Dave Nicponski, Chair

ATTEST:

_____
Jennifer Kennedy, City Recorder

MAYOR'S ACTION: Approved

DATED this ____ day of _____, 2019.

_____
D. Blair Camp, Mayor

ATTEST:

_____
Jennifer Kennedy, City Recorder

CERTIFICATE OF PUBLICATION

I hereby certify that this Ordinance, or a summary hereof, was published according to law on the ___ day of _____, 2019.

_____
Jennifer Kennedy, City Recorder

MURRAY
CITY COUNCIL

Legislative Report

Dale Cox

MURRAY
CITY COUNCIL

Mayor's Report
And Questions

MURRAY
CITY COUNCIL

Adjournment