

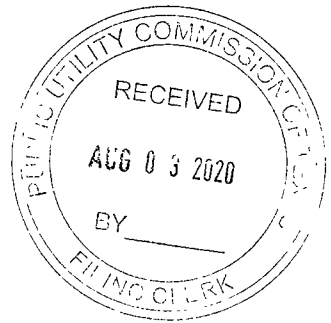


Control Number: 49351



Item Number: 53

Addendum StartPage: 0



SOAH DOCKET NO. 473-19-5674.WS
PUC DOCKET NO. 49351

RATEPAYERS APPEAL OF THE
DECISION BY BEAR CREEK SPECIAL
UTILITY DISTRICT TO CHANGE
RATES

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§
§

BEFORE THE STATE OFFICE

OF

ADMINISTRATIVE HEARINGS

DIRECT TESTIMONY

OF

JOE HELMBERGER, P.E.

ON BEHALF OF BEAR CREEK SPECIAL UTILITY DISTRICT

EXHIBIT BCSUD-2

AUGUST 3, 2020

53

PUC DOCKET NO. 49351
SOAH DOCKET NO. 473-19-5674.WS

DIRECT TESTIMONY OF JOE HELMBERGER, P.E.

WITNESS FOR BEAR CREEK SPECIAL UTILITY DISTRICT

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**DIRECT TESTIMONY OF
JOE HELMBERGER,
WITNESS FOR BEAR CREEK SPECIAL UTILITY DISTRICT**

I. INTRODUCTION, POSITION, AND QUALIFICATIONS

**Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND CURRENT
EMPLOYMENT POSITION.**

A. My name is Joe Helmburger. My business address is 260 East Davis Street, Suite 100,
McKinney, Texas 75069. I am employed by Kimley-Horn and Associates (“KHA”) at our
office in McKinney.

**Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND
PROFESSIONAL EXPERIENCE.**

A. I graduated from the University of Texas at Arlington in 1984 with a Bachelor of Science
in Civil Engineering. I was an Engineer in Training (“EIT”) in Texas from 1984 to 1989
and was licensed by the State of Texas to practice engineering on May 26, 1989. I have
been a licensed professional engineer since that time, and my Texas PE number is 66040.
A copy of my résumé is attached as Exhibit JH-1.

Q. WHAT ARE YOUR RESPONSIBILITIES IN YOUR CURRENT POSITION?

A. I am responsible for client and project management at KHA. I work with a team of
professional engineers in the Utility Group that handles day-to-day design and plan
production for KHA’s clients.

1 **Q. HAVE YOU PREVIOUSLY SUBMITTED TESTIMONY BEFORE THE PUBLIC**
2 **UTILITY COMMISSION OF TEXAS OR THE TEXAS COMMISSION ON**
3 **ENVIRONMENTAL QUALITY?**

4 **A. No.**

5 **Q. WHAT HAVE YOU REVIEWED IN ORDER TO PREPARE FOR YOUR**
6 **TESTIMONY?**

7 **A. I have reviewed the documents that are attached to my testimony as exhibits.**

8 **Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS PROCEEDING?**

9 **A. I am testifying on behalf of Bear Creek Special Utility District (“Bear Creek”).**

10 **II. PURPOSE OF DIRECT TESTIMONY**

11 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?**

12 **A. I am testifying today to provide detailed information regarding Bear Creek’s water system**
13 **as it existed in October 2018, when the Board of Directors adopted the rates that are the**
14 **subject of this appeal. My testimony will provide detailed information about the**
15 **construction and capacity of the system, the planning for system improvements, the**
16 **projected growth resulting from development, and the costs for improvements that needed**
17 **to be made to the system.**

18 **Q. WHAT IS YOUR ROLL WITH BEAR CREEK?**

19 **A. I am Bear Creek’s system engineer and have served in that capacity for over 20 years.**

1 **IV. WATER MASTER PLAN**

2 **Q. HOW HAS BEAR CREEK PLANNED FOR FUTURE IMPROVMENTS?**

3 A. Bear Creek engaged KHA to prepare a Water Master Plan ("WMP") for the system.

4 **Q. WHY DID BEAR CREEK ENGAGE KHA TO PREPARE A WATER MASTER**
5 **PLAN?**

6 A. Bear Creek is growing rapidly because of its location in southeast Collin County, and
7 needed a plan in order to prepare for the growth.

8 **Q. WHAT WAS YOUR ROLL IN PREPARING THE WMP?**

9 A. I managed the project. Todd Strouse, PE and Stuart Williams, PE, along with their Utility
10 Team worked under my direction and supervision to perform the study and prepare the
11 report.

12 **Q. PLEASE EXPLAIN HOW THE WMP WAS PREPARED?**

13 A. An analysis of the existing system was performed, which identified all of the large tracts
14 in Bear Creek and applied a new development density of five lots per acre on 80% of each
15 available tract to determine the buildout connection count. Then, KHA performed an
16 analysis of future water needs, the infrastructure needed to serve the future water demands
17 and the costs associated with the proposed improvements.

18 **Q. WHAT INFORMATION DID YOU REVIEW TO PREPARE THE WMP?**

19 A. We reviewed the existing system record drawings and existing aerial photography of the
20 Bear Creek service area.

1 **Q. WHEN WAS THE WMP COMPLETED AND PRESENTED TO BEAR CREEK**
2 **FOR APPROVAL?**

3 A. The original WMP was finalized June 2017 and subsequently updated October 2018. The
4 original WMP that was approved by Bear Creek in 2017 is attached as Exhibit JH-3. The
5 updated WMP that was approved by Bear Creek is attached as Exhibit JH-4.

6 **Q. WHAT WAS THE RESULT OF THE WMP?**

7 A. The WMP determined the additional facilities that would be required to serve all customers
8 at Bear Creek's full system buildout. Those facilities include:

9 • Pressure Plane 1 needs 4 additional 1,200 gpm pumps, 1 additional 1,000,000-gallon
10 ground storage tank. No additional elevated storage.

11 • Pressure Plane 2 needs 4 additional 2,000 gpm pumps, 2 additional 2,000,000-gallon
12 ground storage tanks and 1 additional 1,500,000-gallon elevated storage tank.

13 • Pressure Plane 3 needs 4 additional 1,700 gpm pumps, 2 additional 1,000,000-gallon
14 ground storage tanks, 1 additional 500,000-gallon ground storage tank and 1 additional
15 1,000,000-gallon elevated storage tank.

16 **Q. WHAT RECOMMENDATIONS DID YOU MAKE TO BEAR CREEK**
17 **REGARDING THE IMPROVEMENTS SET FORTH IN THE WMP?**

18 A. No specific recommendations were made to Bear Creek. The WMP was used to identify
19 projects that need to be built as Bear Creek continues to grow. As part of the study, we
20 evaluated future water demands and water infrastructure necessary to meet these demands.
21 Twenty-three different WMP projects were identified to meet this demand from the time
22 of the study was adopted until buildout.

1 **Q. WHY DID BEAR CREEK DECIDE TO PROCEED WITH THE PUMP STATION**
2 **#2 IMPROVEMENTS FIRST?**

3 A. The Pump Station #2 Improvements at Project 16 in the WMP. There were numerous
4 reasons for the improvements proposed at Pump Station #2. One of the main reasons was
5 to provide the ability to maintain the existing 500,000-gallon ground storage tank. In
6 addition to upgrades at the pump station, upgrades are necessary to the water line that
7 serves pressure zone #1. Currently, all the water provided to pressure zone #1 is delivered
8 to the system through a single 8-inch water line. This line has been identified to be
9 upgraded to a 16-inch line from the pump station to SH 78 and then a 12-inch water line
10 as it continues north along SH 78. This line is necessary to provide increased pumping
11 capacity to pressure zone #1 and the ability to provide fire flow to customers when the
12 existing elevated storage tank in pressure plane #1 is taken out of service for maintenance.

13 This project is also necessary in order to provide a separate pump station and 2,000,000-
14 gallon ground storage tank for pressure zone #2. Pumps for pressure zone #1 and pressure
15 zone #2 are currently located on top of an existing 500,000-gallon concrete ground storage
16 tank. The pump station at this delivery point (#2) accounts for 60% of the customers and
17 is the only delivery site source for pressure zones #1 and #2. The lack of redundancy for
18 delivery to the ground storage tank is unacceptable. The pump station at delivery point #1
19 would not have the capacity to support the system in the event of an outage at delivery
20 point #2. In addition, the pump station needs to be moved from on top of the ground storage
21 tank. Locating the pumps on top of the ground storage tank has proven to create
22 maintenance issues and safety hazards.

1 **Q. PLEASE DESCRIBE THE PUMP STATION #2 IMPROVEMENTS.**

2 A. The proposed improvements will provide a separate pump station and 2,000,000-gallon
3 ground storage tank for pressure zone #2. The project also includes approximately 7,000
4 linear feet of 12-inch water lines and 1,600 linear feet of 16-inch water lines from the
5 existing pump station located on Geren Drive to the intersection of SH 78 and Bently Drive.
6 This project will give Bear Creek the ability to pump to both pressure zone #1 and pressure
7 zone #2 from two separate pump galleries and two separate ground storage tanks. The
8 project site is in Collin County, Texas, in the City of Lavon, south of State Highway 78,
9 north of County Road 484, and west of Geren Drive. Upon completion, the proposed
10 improvements will allow for emergency interconnection between pressure zone #1 and
11 pressure zone #2, provide operational flexibility, and increase pumping capacity for both
12 pressure zones. The Pump Station #2 improvements will be designed to service both
13 pressure zone #1 and pressure zone #2. The discharge piping from the existing pumps will
14 be modified so that they serve only pressure zone #1. Pump Station #2 improvements will
15 include the following facilities with this project:

- 16 • Pressure Zone #1 – 3.3 MGD (initial firm capacity) Pump Station.
- 17 • Pressure Zone #2 – 5.76 MGD (initial firm capacity) Pump Station with capability to
18 expand, 2,000,000-gallon ground storage tank that will receive water from the North Texas
19 Municipal Water District (“NTMWD”) distribution system through the existing Bear
20 Creek Meter, discharge flow meter, electrical equipment, SCADA, and existing 500,000-
21 gallon ground storage tank.

1 **Q. HOW DO THE PUMP STATION #2 IMPROVEMENTS IMPROVE THE BEAR**
2 **CREEK SYSTEM?**

3 A. The project will move the pump station from on top of the ground storage tank to an area
4 at ground level, which will facilitate maintenance responsibilities associated with the pump
5 station and limit the safety concerns associated with working on top of a ground storage
6 tank. By the time the proposed pump station is constructed in 2020, the system will have
7 approximately seven (7) hours of ground storage capacity available during a maximum day
8 event for delivery point #2. This is unacceptable as it only achieves 58% of the engineer's
9 recommendation for ground storage capacity. The proposed 2,000,000-gallon ground
10 storage tank will include yard piping and valving to allow for emergency interconnection
11 between pressure zone #1 and pressure zone #2. This capability will provide adequate
12 ground storage capacity for emergency events at delivery point #2 when constructed in
13 2020. The proposed upgrades are necessary to provide both adequate facilities and
14 improved water distribution.

15 **Q. WHAT WAS YOUR INITIAL PROJECTED COST FOR THE PUMP STATION #2**
16 **IMPROVEMENTS?**

17 A. The costs are shown in the Opinion of Probable Costs that is attached to the WMP update
18 (Exhibit JH-4) for projects 16.2.1 and 18.

V. NON-WMP IMPROVEMENTS

Q. WHAT IMPROVEMENTS HAS BEAR CREEK BEEN REQUIRED TO MAKE THAT ARE NOT IN THE WMP?

A. Bear Creek is responsible for relocating miles of water mains as the State Highway system is expanded. State Highway 78, State Highway 205, State Highway 66 and Farm to Market 552 and Farm to Market 2755 all pass-through Bear Creek. As the Texas Department of Transportation requests relocations, Bear Creek is responsible to act.

Q. WHAT IMPROVEMENTS HAD BEAR CREEK UNDERTAKEN AT THE TIME THE RATES WERE ADOPTED IN OCTOBER 2018?

A. Bear Creek is responsible for moving water lines in preparation for the widening of State Highway 205 (“SH 205”). This project consisted of relocating approximately 8,700 linear feet of 12-inch water line, 9,000 linear feet of 8-inch water line, and 200 linear feet of 6-inch water line. Bear Creek will be reimbursed by TxDOT for up to 59% of the project. The portions of the project that are not deemed reimbursable are due to the physical location of the water line or a new water line being installed along SH 205.

Q. WHY DID BEAR CREEK MAKE THOSE IMPROVEMENTS?

A. Bear Creek is required to move water lines out of the right-of-way or an easement when the water line conflicts with roadway expansion. In addition, new water line was installed along SH 205 in various locations to provide fire flow capability to future and existing commercial businesses.

1 **Q. WHAT WAS YOUR PROJECTED COST FOR THE SH 205 RELOCATION?**

2 A. The total projected cost to Bear Creek including property acquisition, professional services,
3 and construction is estimated to be \$1,256,698.36.

4 **Q. WHAT WERE THE ACTUAL COSTS FOR THE SH 205 RELOCATION?**

5 A. Actual costs have yet to be determined, as the project has not yet been bid for construction.

6 **VI. CONCLUSION**

7 **Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

8 A. Yes.

Exhibit JH-1

Joe Helmberger, P. E. – Civil Engineer (TX)

Joe has over 37 years of experience in planning, design, plan production and construction management. Joe is currently part of the Planning Team updating the City of Princeton's Impact Fee Ordinance. During his career he has worked as the Engineer-of-Record for numerous municipalities and special utility districts across the Metroplex and has extensive knowledge in planning, design, plan production and contract administration for improvements as diverse as site improvement for existing municipal buildings and parks, municipal streets and utilities, county roads, industrial subdivisions, medical, commercial and retail developments and drainage improvements for a multitude of clients, both public and private. Joe also has 10 years of experience in the design, construction management, start-up and maintenance of power generation facilities and steam systems ranging in size from 2,000 to 500,000 pounds per hour.

Professional Credentials

- Bachelor of Science, Civil Engineering, University of Texas, Arlington
- Professional Engineer in Texas (#66040)
- Senior Associate at Kimley-Horn
- American Society of Civil Engineers, Member

Relevant Experience

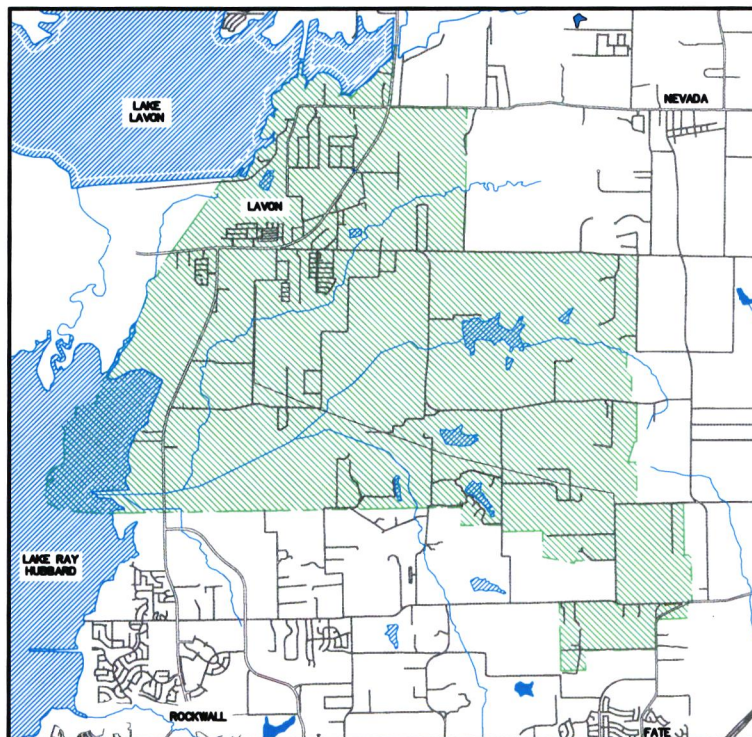
- City Engineer, City of Princeton - Princeton – TX
- System Engineer, Bear Creek Special Utility District – Lavon, TX
- Water, Wastewater, and Roadway Impact Fee Study – Princeton, TX
- Stormwater Utility Study – Princeton, TX
- Water, Wastewater, and Roadway Impact Fee Study Update – Princeton, TX
- Master Drainage Plan – Princeton, TX
- Comprehensive Plan Update – Princeton, TX
- Old Downtown Visioning Study – Princeton, TX
- Citywide Parks Masterplan Study – Princeton, TX
- Princeton Public Works Building Site Improvements – Princeton, TX
- Princeton Municipal Complex Site Improvements – Princeton, TX
- Forest Grove Pump Station Site Improvements – Princeton, TX
- Fire Station #2 Site Improvements – Princeton, TX
- Fire Station #3 Site Improvements – Princeton, TX
- Parkview Heights Park Site Improvements – Princeton, TX
- J.M. Caldwell, Sr. Community Park Masterplan – Princeton, TX
- J.M. Caldwell, Sr. Community Park Site Improvements (numerous phases) – Princeton, TX
- Veterans Memorial Park Site Improvements – Princeton, TX
- 3rd Street Park Site Improvements – Princeton, TX
- JJ "Book" Wilson Memorial Park Masterplan – Princeton, TX
- Wylie Community Park Lighting Improvements – Wylie, TX
- Twin Lakes Park Trail Improvements – Wylie, TX

Exhibit JH-1

- Bozman Park Conceptual Trail Design – Wylie, TX
- Founders Park Irrigation Improvements – Wylie, TX
- Avalon Park Site Improvements – Wylie, TX
- Numerous Street Rehabilitation Projects – Princeton, TX
- Design Manual Updates – Princeton, TX
- North Beauchamp Boulevard – Princeton, TX
- Monte Carlo Boulevard - Princeton, TX
- Alignment Study and Preliminary Engineering for Myrick Lane from FM982 to FM 546 – Princeton, TX
- Wylie Historic Brown House Adaptive Reuse Project – Wylie, TX
- Wylie Historic Stonehaven Adaptive Reuse Project – Wylie, TX
- Wylie Historic Brown House Phase 1 Site Improvements – Wylie, TX
- Princeton Historic Methodist Church Adaptive Reuse Project – Princeton, TX
- Princeton Historic Methodist Church Site Improvements – Princeton, TX

Bear Creek Special Utility District

WATER DISTRIBUTION SYSTEM



LOCATION MAP



JANUARY 2018



BEAR CREEK SUD

16881 C.R. 541 P.O. Box 188
Lavon, Texas 75166 Lavon, Texas 75166
TEL 972-943-2101 TEL 972-843-2101
Fax 972-853-2505 Fax 972-853-2505

Kimley»Horn

Texas Board Of Professional Engineers Firm Registration Number: F-228
108 West Louisiana Street, McAllen, TX 78501 409-301-2580

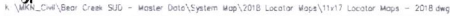
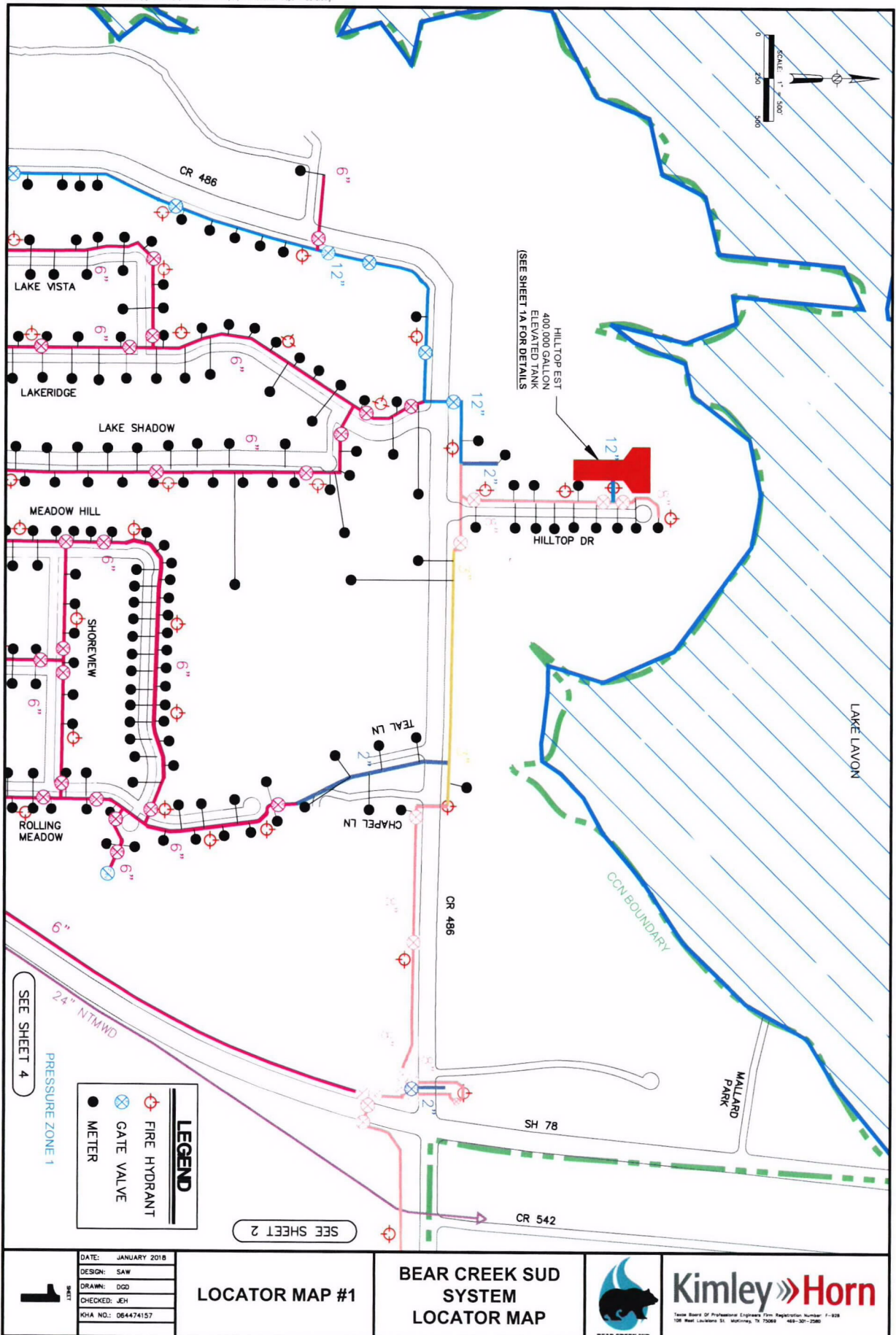
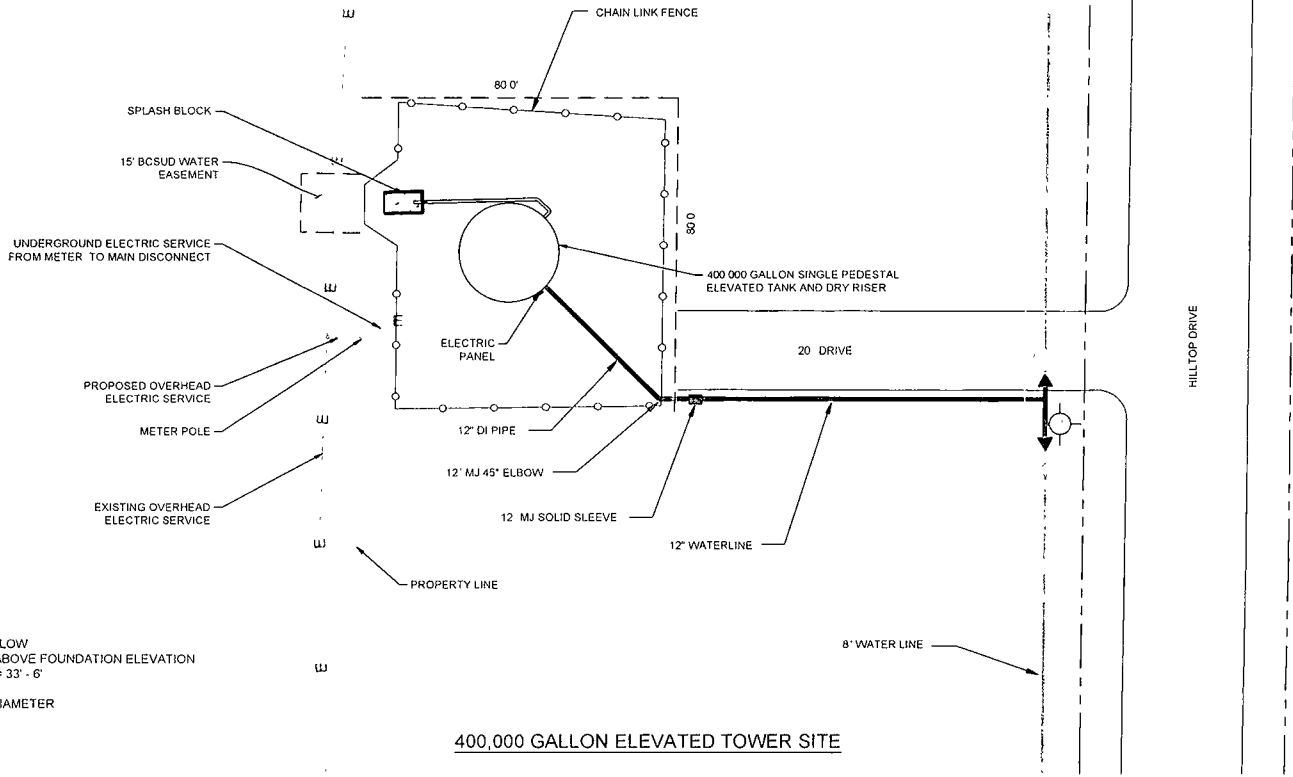
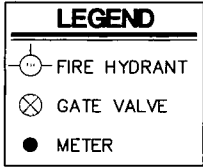
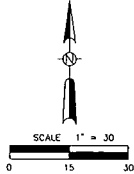


Exhibit JH-2





150' TO OVERFLOW
HWL = 150.0 ABOVE FOUNDATION ELEVATION
HEAD RANGE = 33' - 6'
LWL = 116'-6"
51'-6" INSIDE DIAMETER

400,000 GALLON ELEVATED TOWER SITE

Kimley»Horn
Team Spirit • Professional Engineers • City Registration Number: 1-123
100 West Lockwood St., Madison, WI 53703 • 608-227-7280

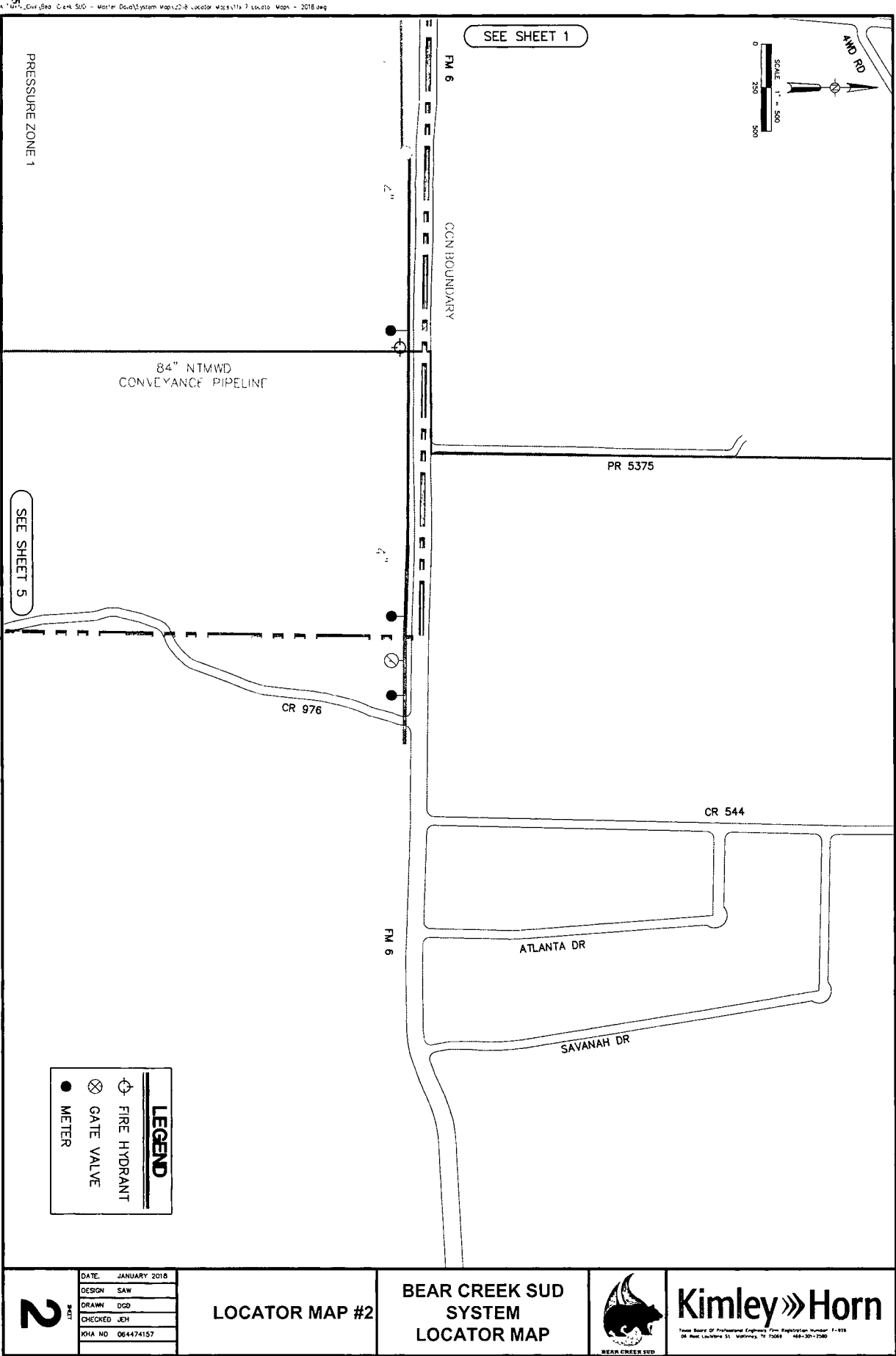


**BEAR CREEK SUD
SYSTEM
LOCATOR MAP**

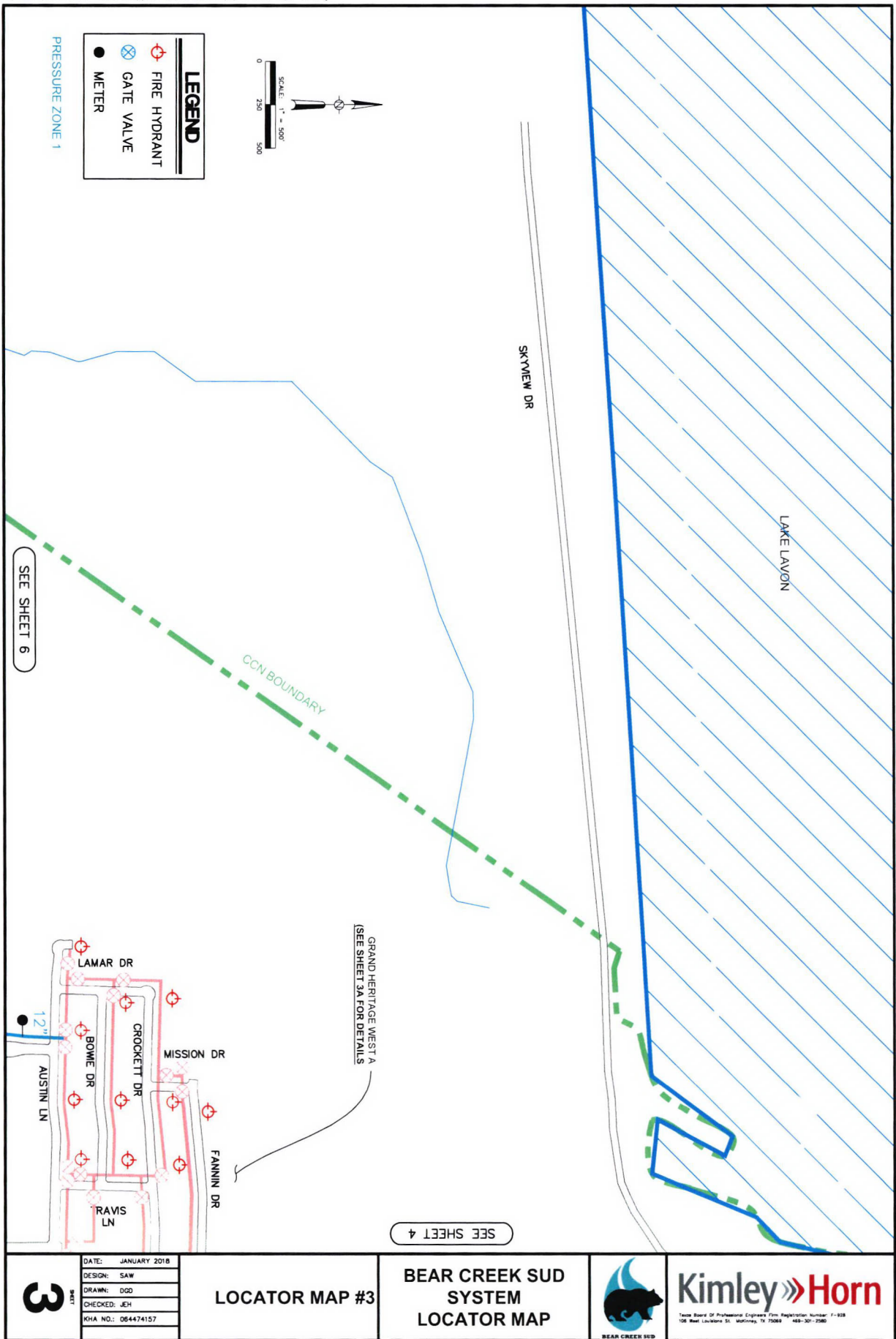
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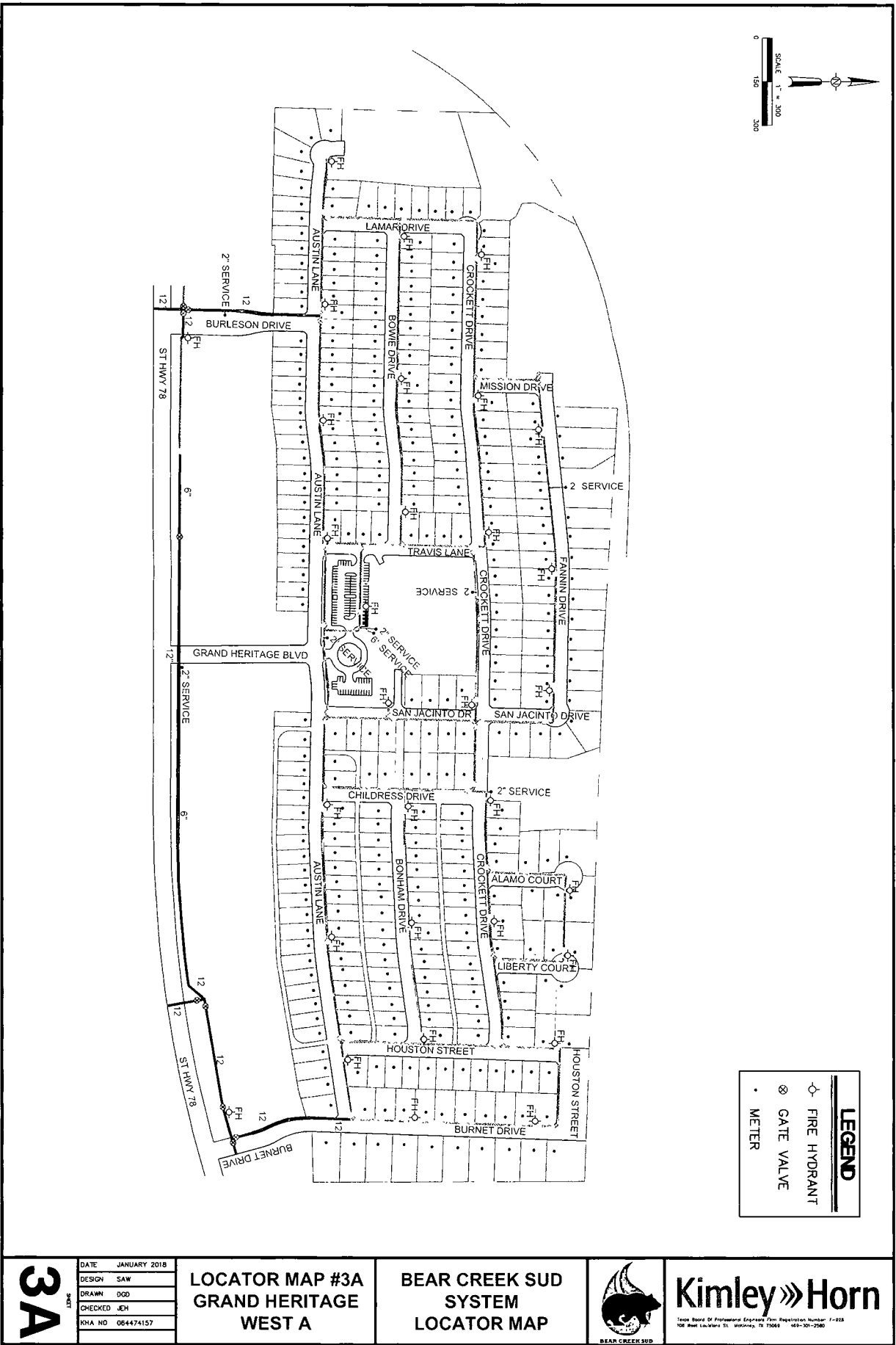
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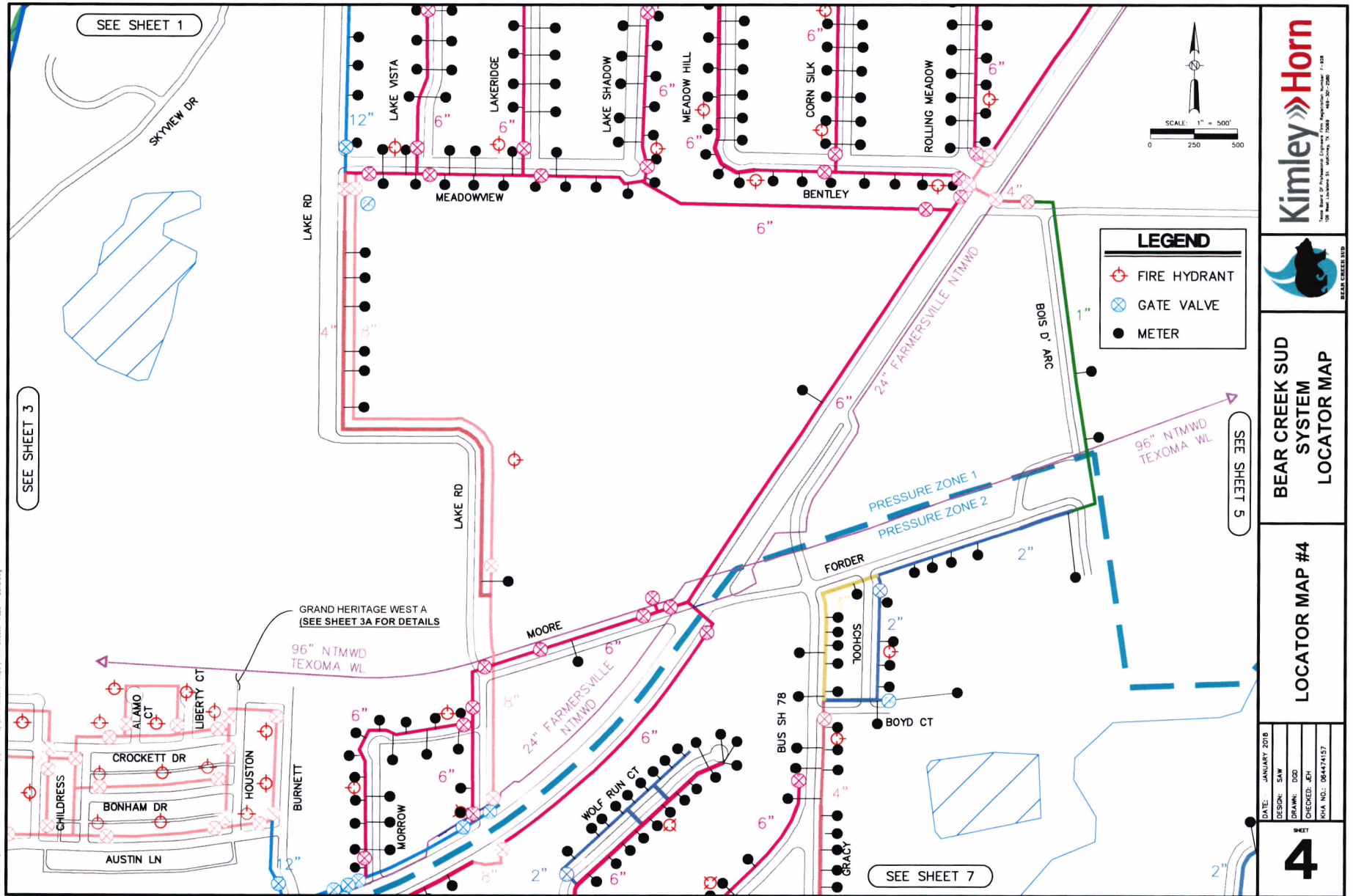


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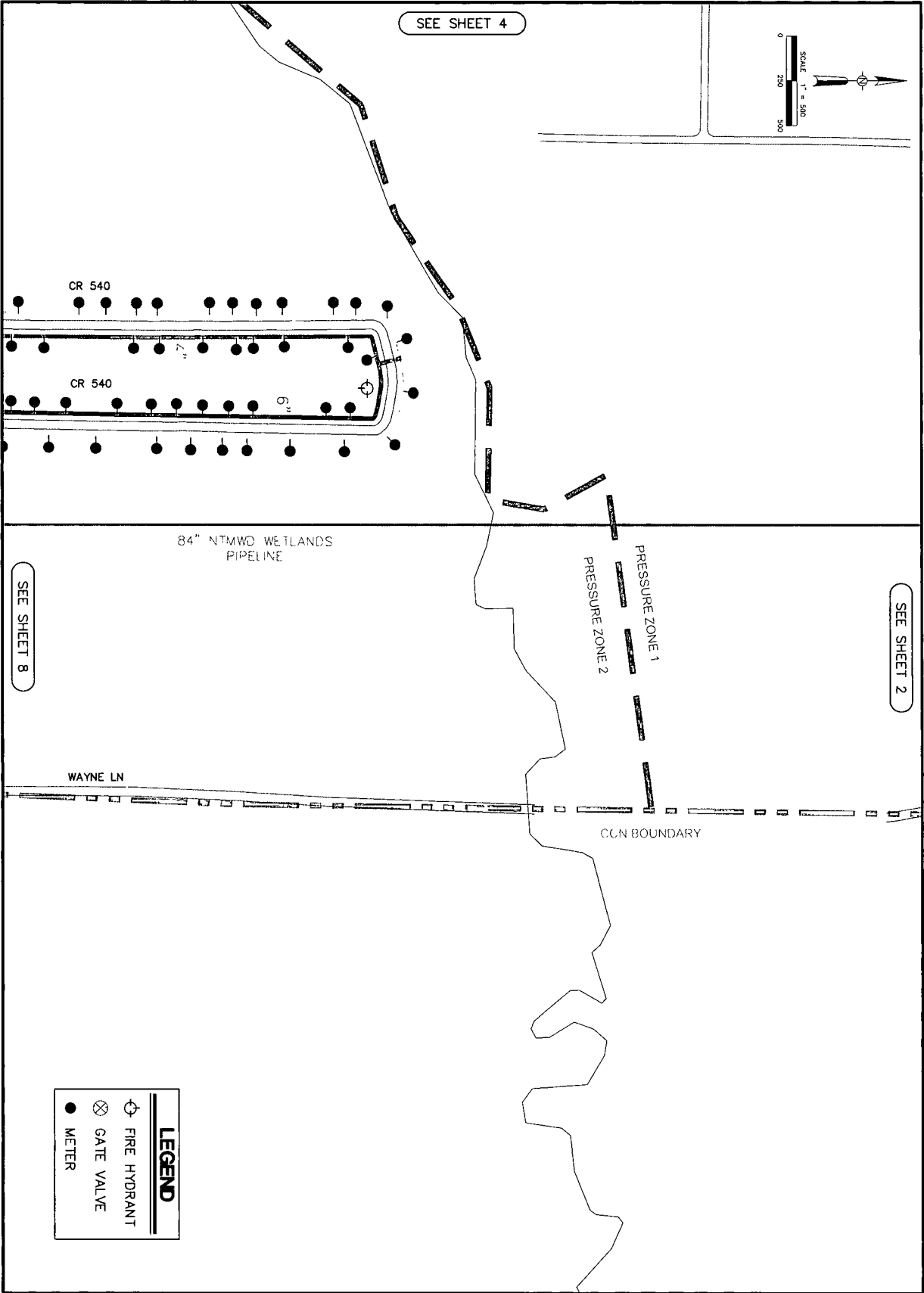


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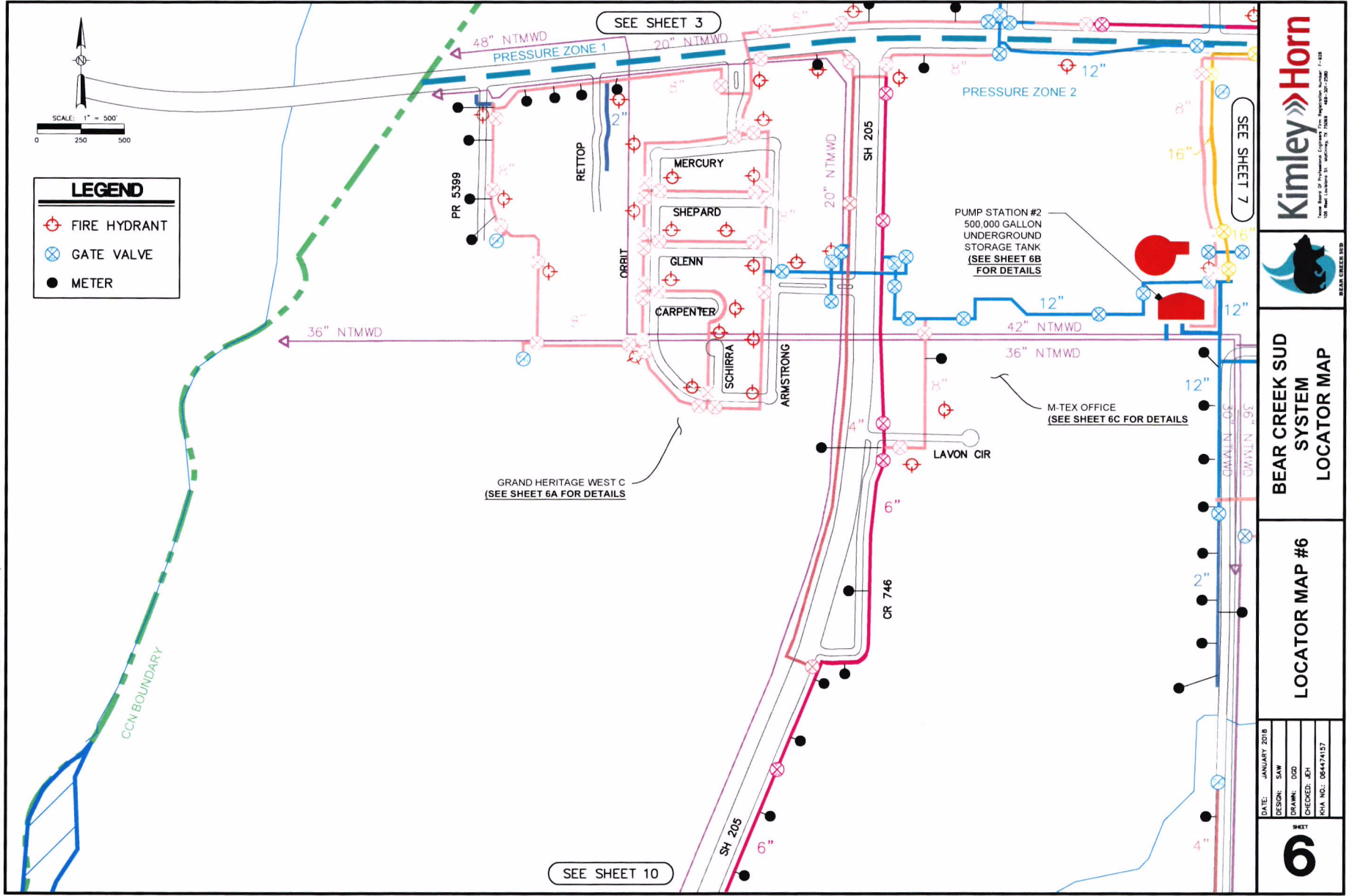


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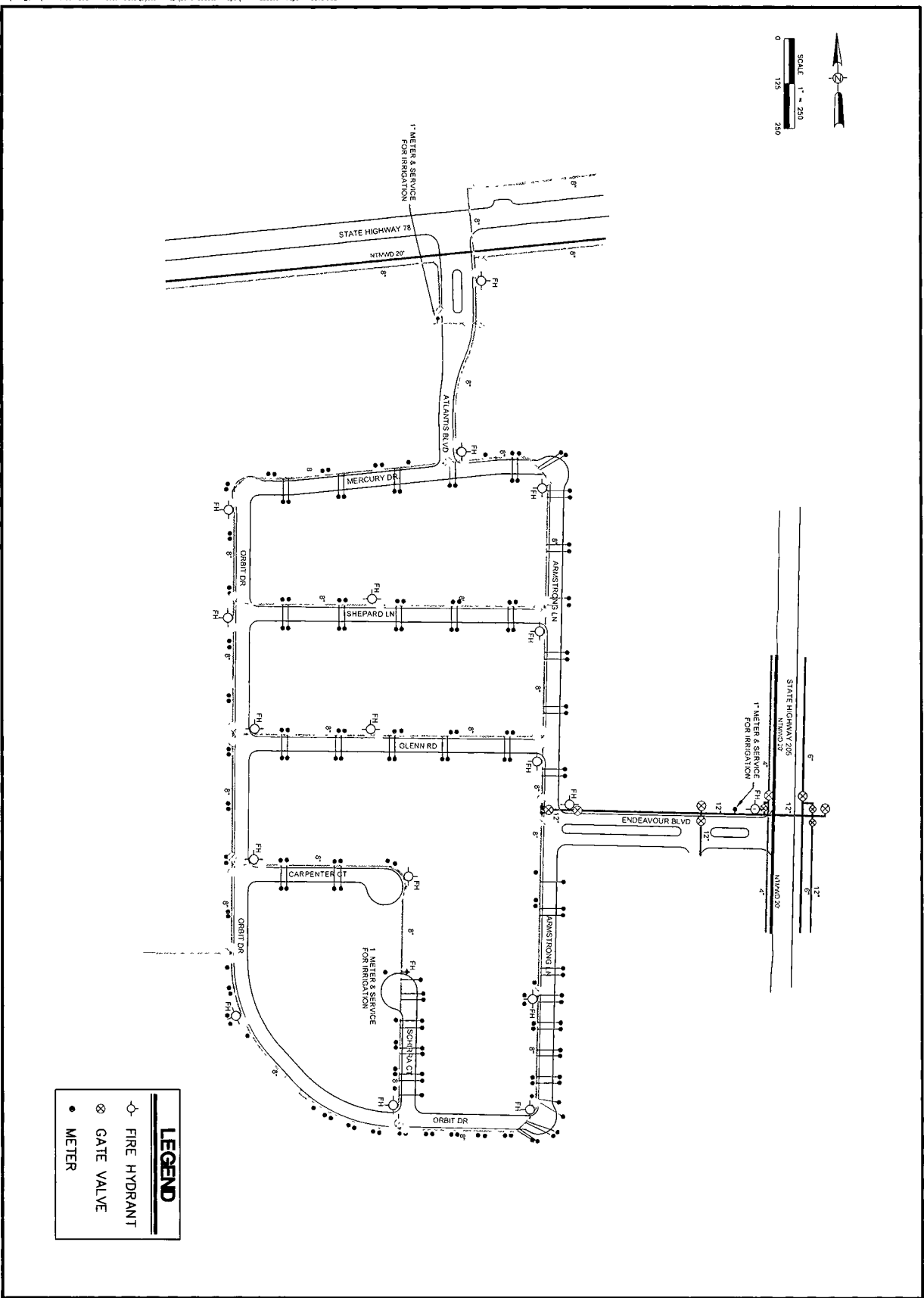


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	CHECKED: JEH				
	KHA NO: 064474157				

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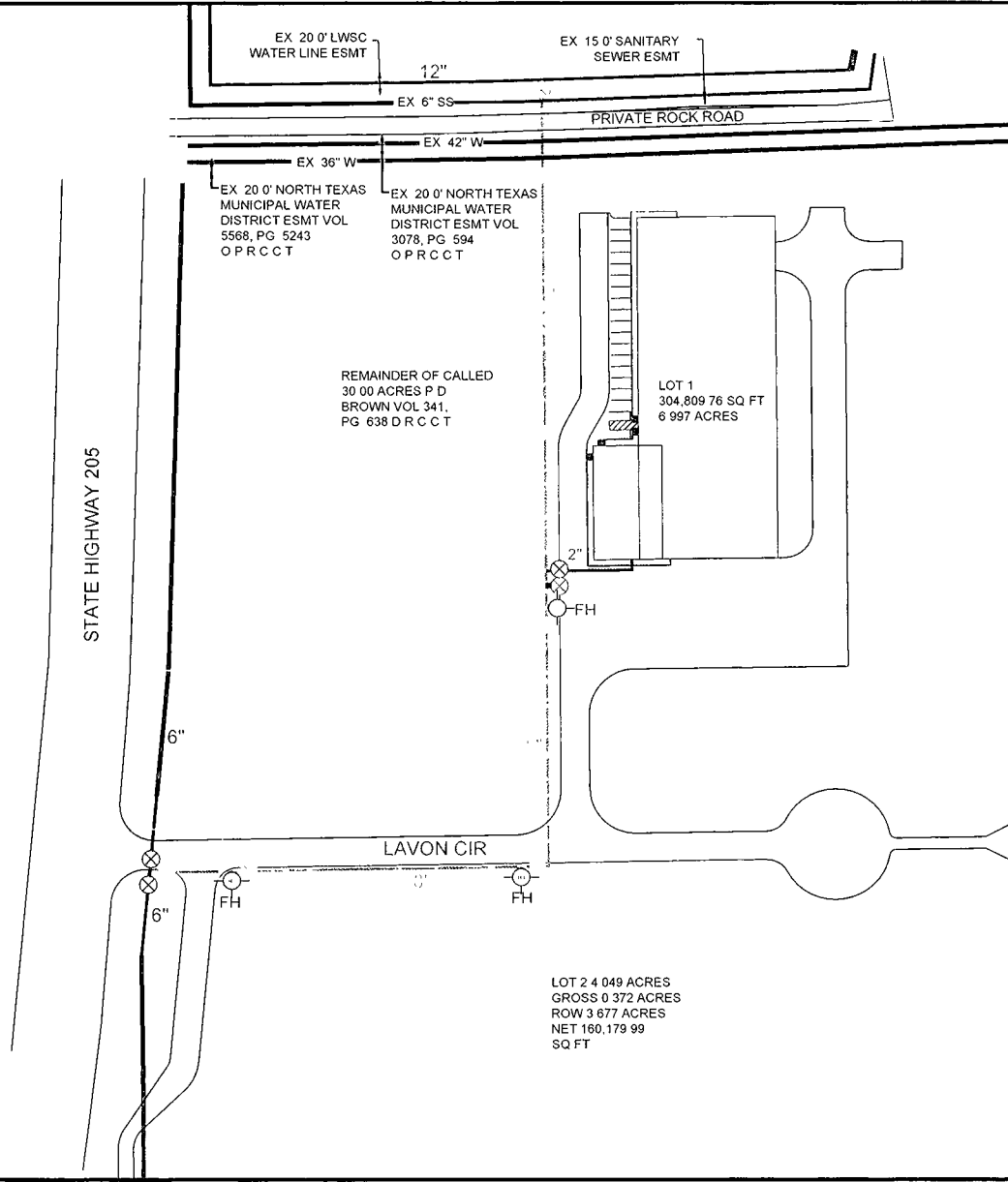
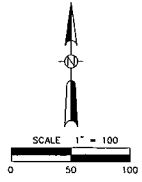
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6A SHEET	DATE	JANUARY 2018
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	CHECKED	JEH
	KHA NO	064474157

LOCATOR MAP #6A GRAND HERITAGE WEST C	BEAR CREEK SUD SYSTEM LOCATOR MAP	 Kimley»Horn <small>Texas Board Of Professional Engineers Firm Registration Number: F-928 100 West Louisiana St. McKinney, TX 75069 469-301-2580</small>
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Exhibit JH-2



LEGEND

FIRE HYDRANT

GATE VALVE

METER

DATE: JANUARY 2018

DESIGN: SAW

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CHECKED: EKH

SHA NO: 084474157

6C

SHEET

LOCATOR MAP #6C

M-TEX OFFICE

BEAR CREEK SUD

SYSTEM

LOCATOR MAP

Kimley»Horn

Team Lead: Dr. Andrew C. Kimley, P.E., Registration No. 1-123

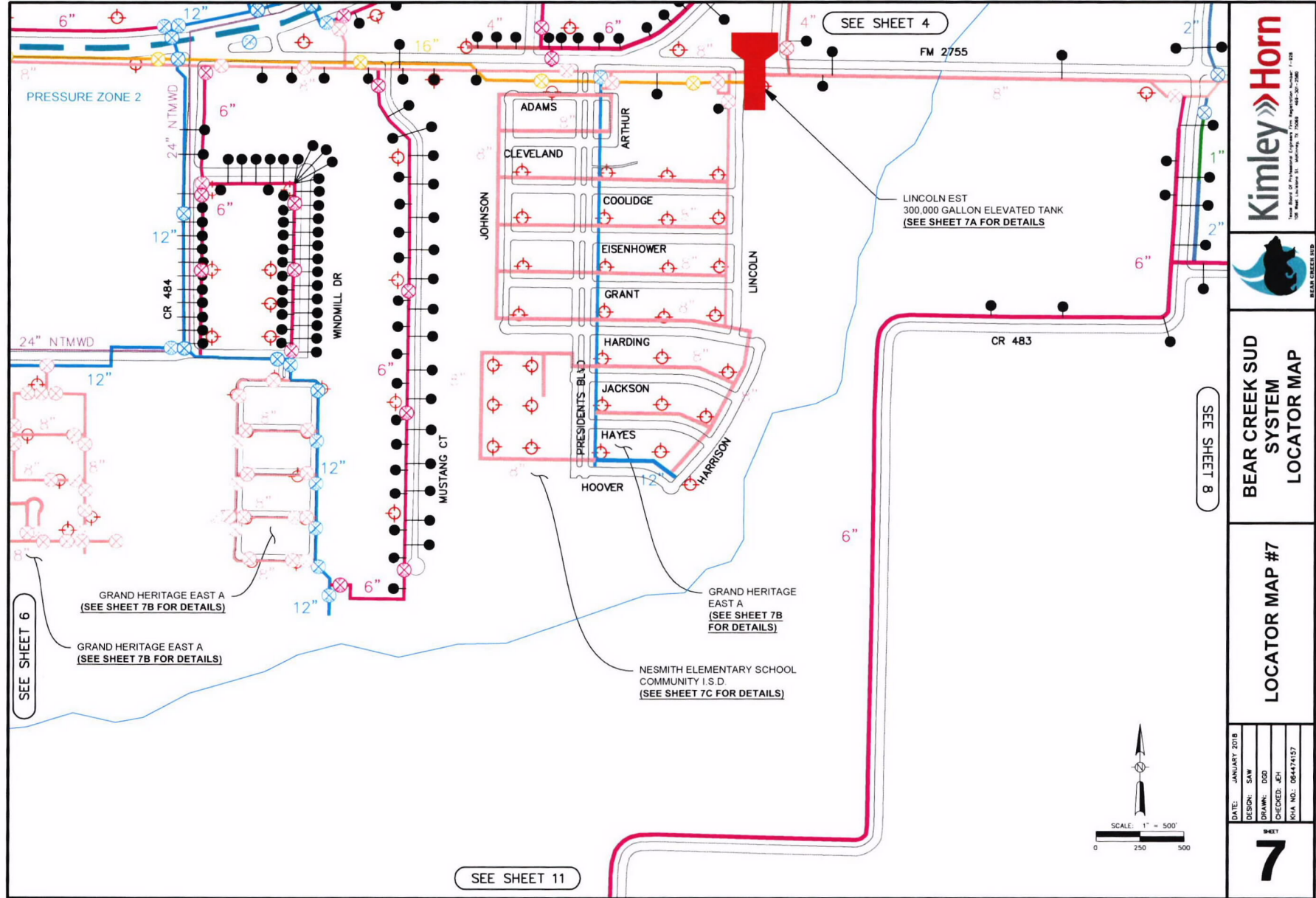
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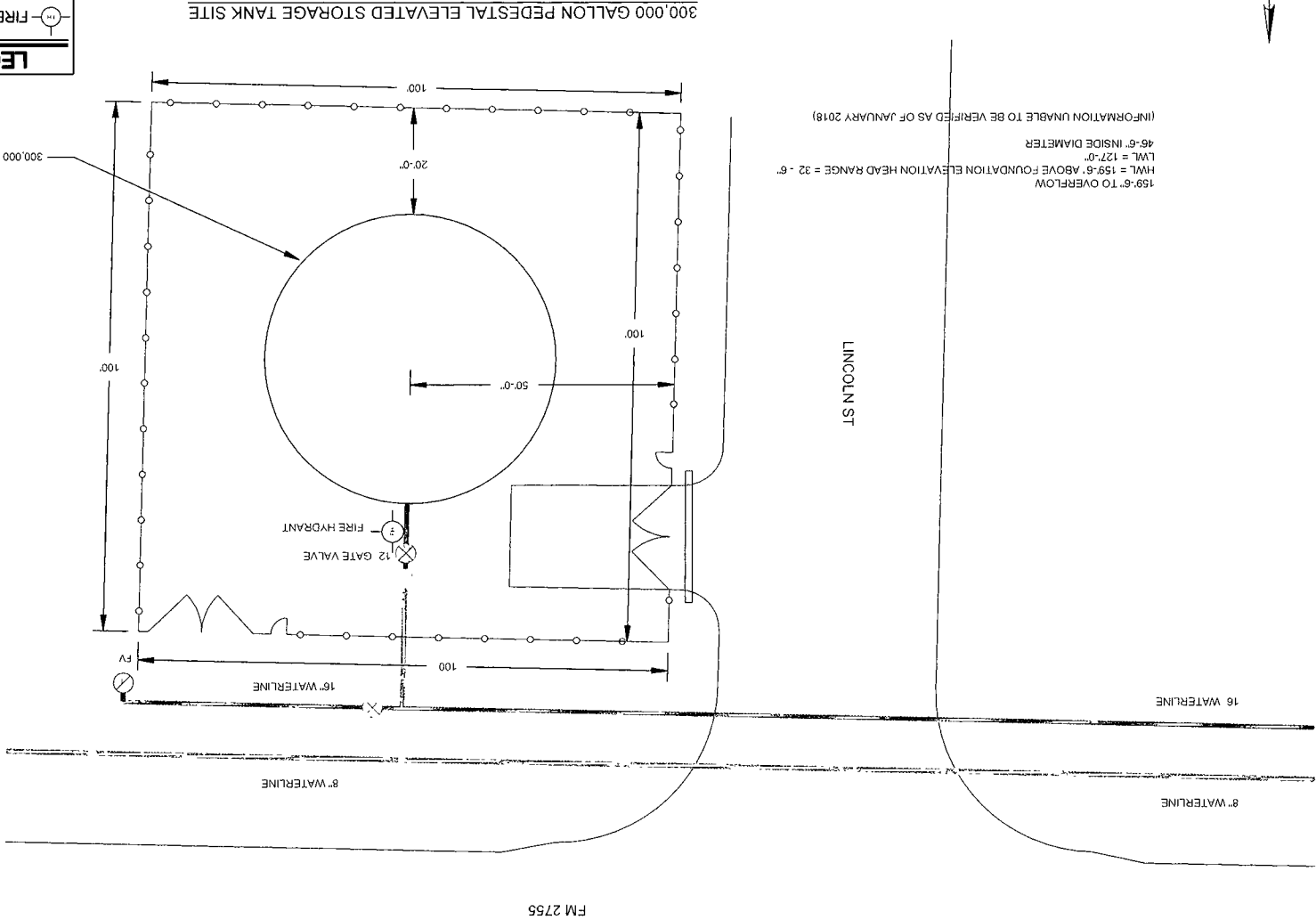
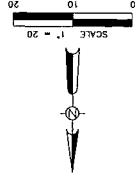
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Kimley-Horn & Associates, Inc. Bear Creek SUD - M-TEX Office Locators Map - 2018.dwg

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BEAR CREEK SUD SYSTEM LOCATOR MAP	
LOCATOR MAP #7	
<small>DATE: JANUARY 2018 DESIGN: SAW DRAWN: DOD CHECKED: JH PWA NO: 084474157</small>	7



LEGEND	
	GATE VALVE
	FIRE HYDRANT
	REDUCER

<div>7A</div> <div>7A</div>	DATE	JANUARY 2018
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	QA NO	06474157

LOCATOR MAP #7A

LINCOLN EST

BEAR CREEK SUD

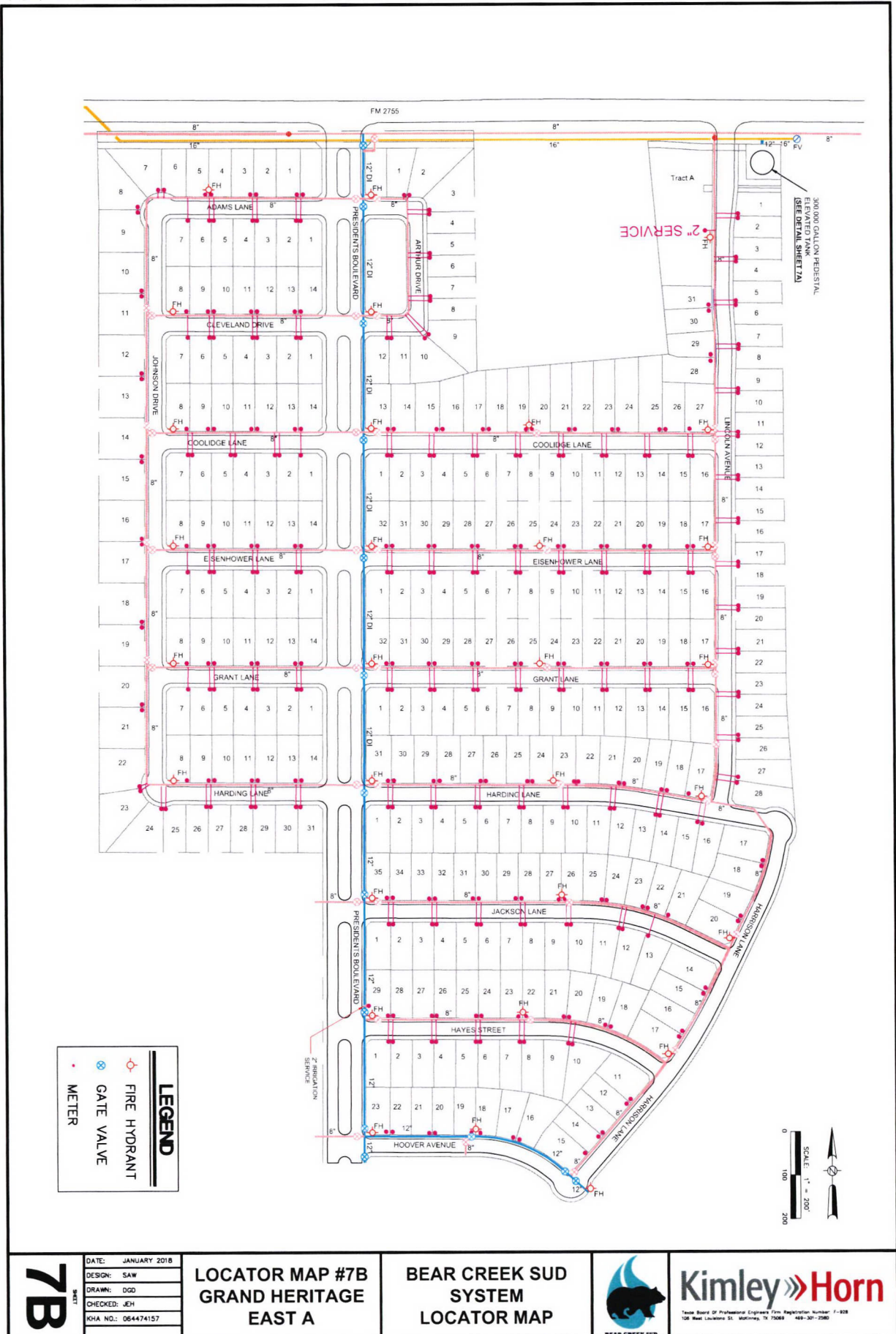
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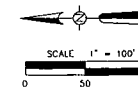
LOCATOR MAP




Kimley»Horn

1000 West 17th Avenue, Suite 100, Fort Collins, CO 80521
 970.226.7280

Exhibit JH-2





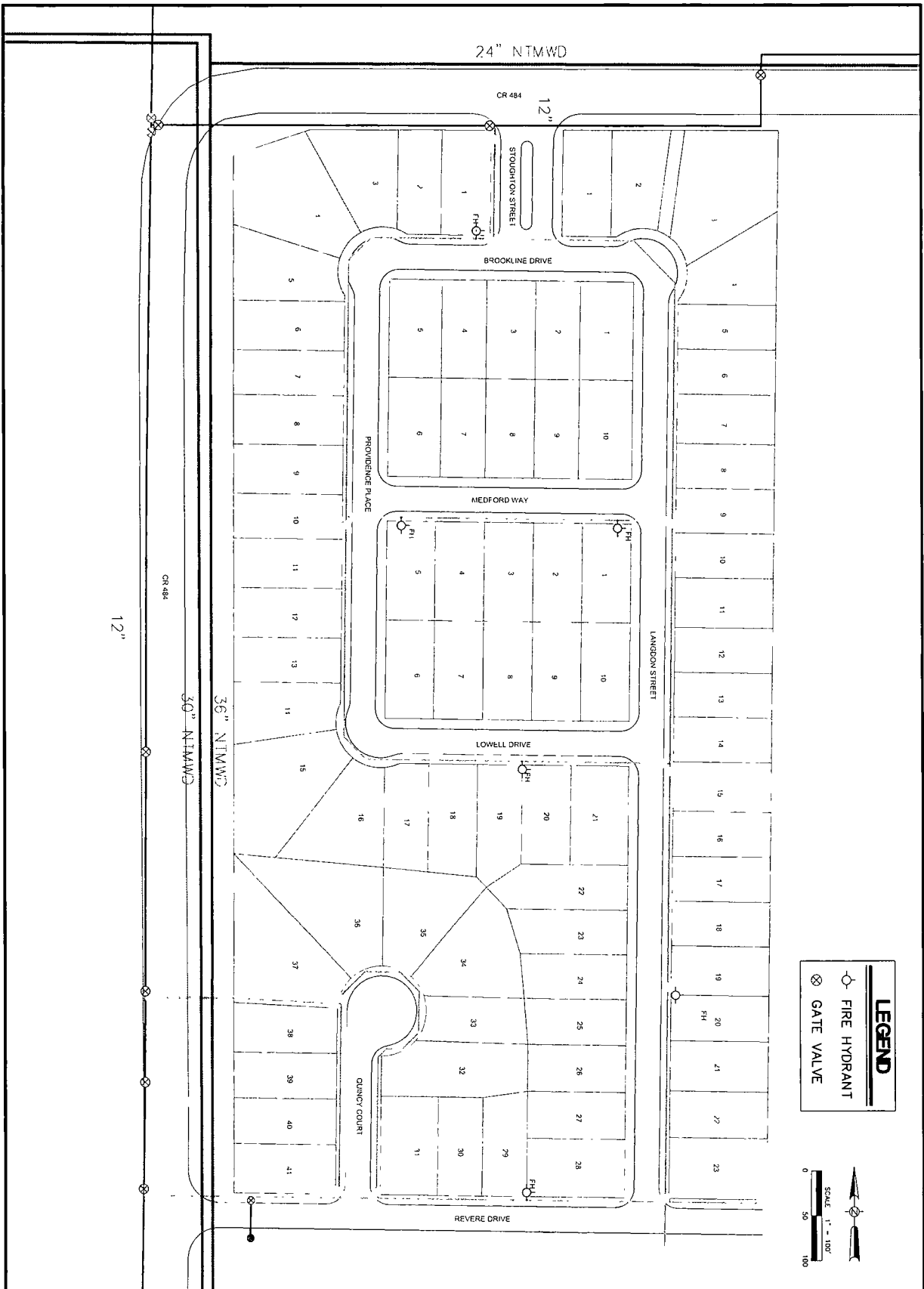
 FIRE HYDRANT
 GATE VALVE
 METER

LOCATOR MAP #7C
NESMITH ELEMENTARY

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AKA NO.	064474157

7C





DATE	JANUARY 2018
DESIGN	SAW
DRAWN	DDG
CHECKED	JH
KHA NO	064474157

LOCATOR MAP #7E
TRADITIONS AT GRAND
HERITAGE WEST

BEAR CREEK SUD
SYSTEM
LOCATOR MAP



Kimley»Horn
Texas Board of Professional Engineers Firm Registration Number 1-018
100 West Louisiana St. Suite 400 Dallas, TX 75201 469-307-7500

Exhibit JH-2

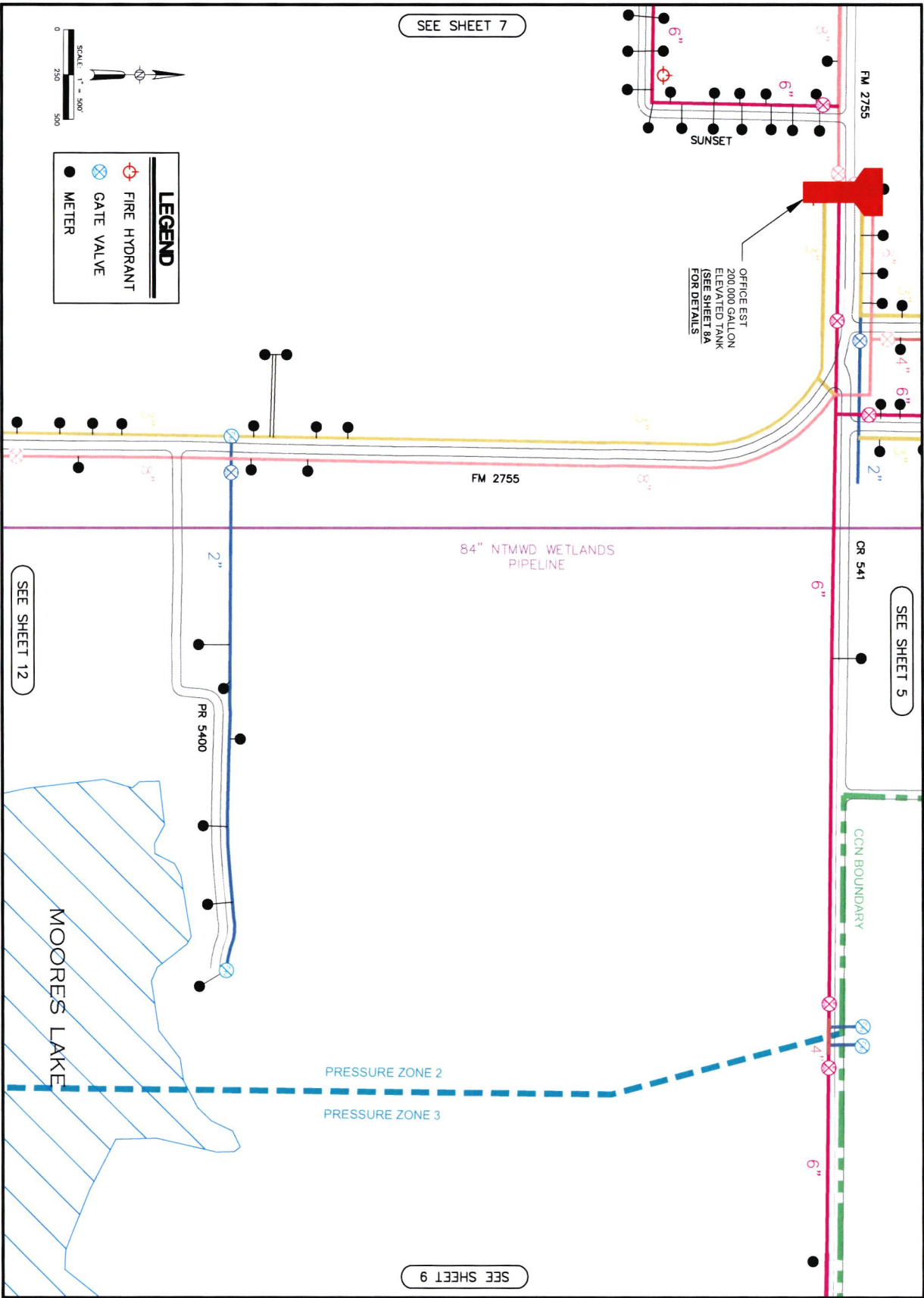
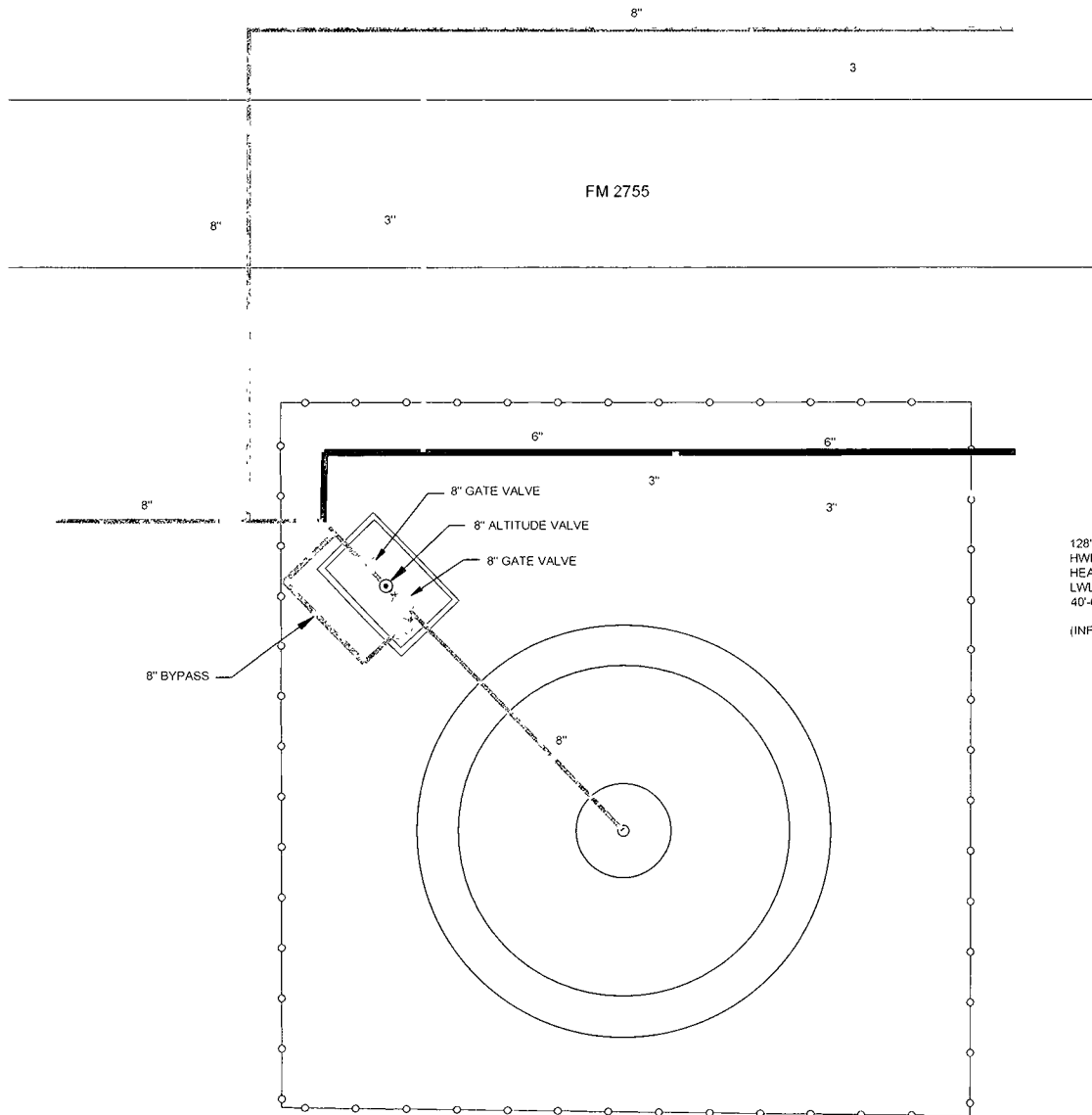


Exhibit JH-2



128'-8" TO OVERFLOW
 HWL = 128'-8" ABOVE FOUNDATION ELEVATION
 HEAD RANGE = 28' - 9"
 LWL = 100'-0"
 40'-6" INSIDE DIAMETER
 (INFORMATION UNABLE TO BE VERIFIED AS OF JANUARY 2018)

SCALE NOT TO SCALE

LEGEND

⊙ ALTITUDE VALVE

⊗ GATE VALVE

Kimley-Horn
Team Sheet of Professional Engineer Tim Kimley, License Number 1-473
 138 West Lockwood St., Madison, WI 53703
 608.261.2000

BEAR CREEK SUD

BEAR CREEK SUD
 SYSTEM
 LOCATOR MAP

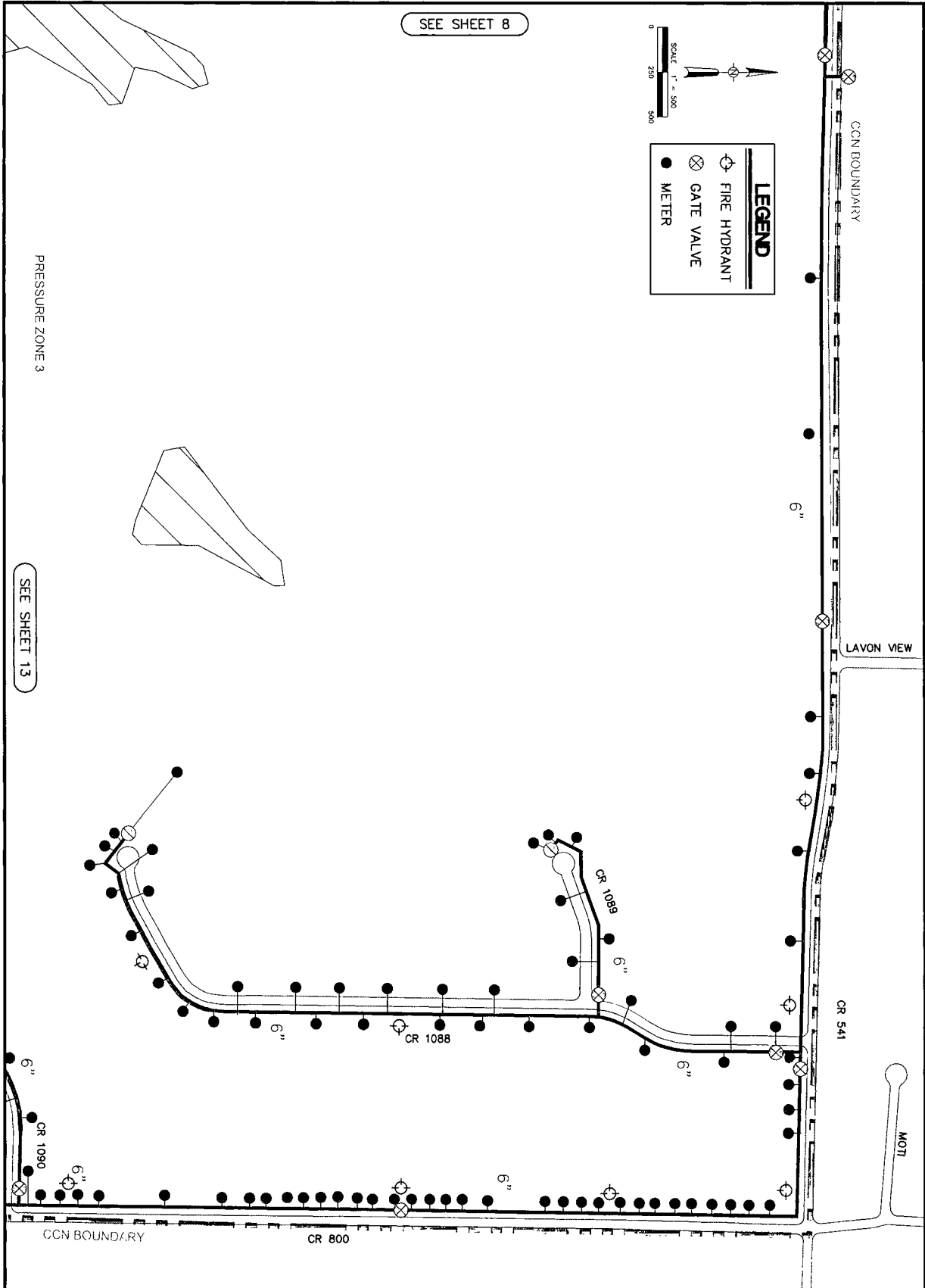
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RVA NO	084474157

SKET

8A

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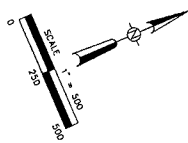


	DATE: JANUARY 2016	LOCATOR MAP #9	BEAR CREEK SUD SYSTEM LOCATOR MAP		Kimley»Horn <small>Texas Board Of Professional Engineers Firm Registration Number: F-978 106 West Loop West Suite 211 Houston, TX 77060 409-501-2500</small>
	DESIGN: SAW				
	DRAWN: DGD				
	CHECKED: JEH				
	NSHA NO: 064474157				

Exhibit JH-2

Page 37 of 125

Kimley-Horn & Associates, Inc. Bear Creek SUD - Water Distribution Map, 2018 Locality Map, 2018 Locality Map - 2018.dwg



PRESSURE ZONE 2

LAKE LAVON

SEE SHEET 6

SEE SHEET 14

SEE SHEET 11

LEGEND

- ⊕ FIRE HYDRANT
- METER
- ⊗ GATE VALVE

10	DATE	JANUARY 2018
	DESIGN	SAW
	DRAWN	DGD
	CHECKED	JEN
	WHA NO	064474167

LOCATOR MAP #10

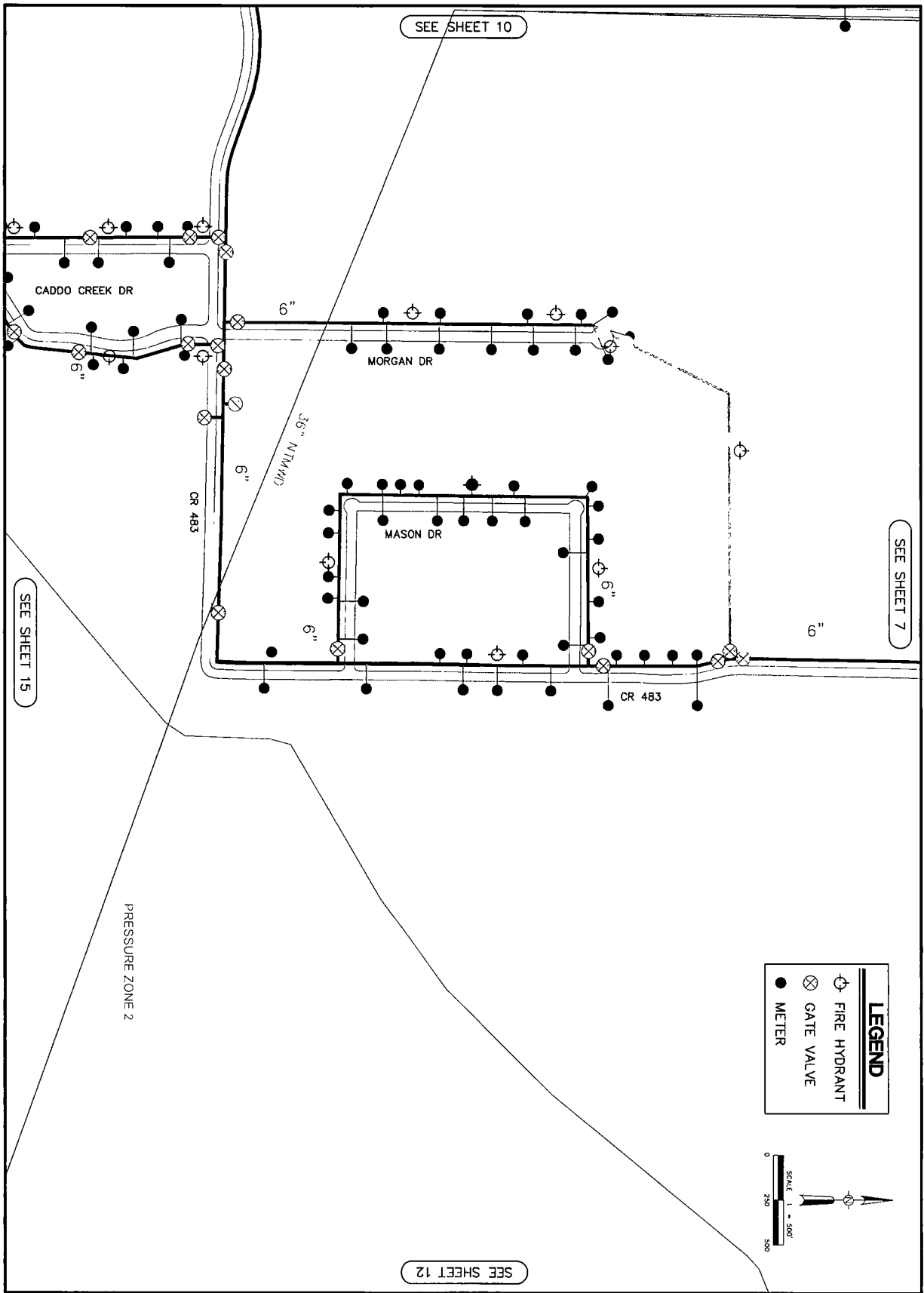
BEAR CREEK SUD
SYSTEM
LOCATOR MAP



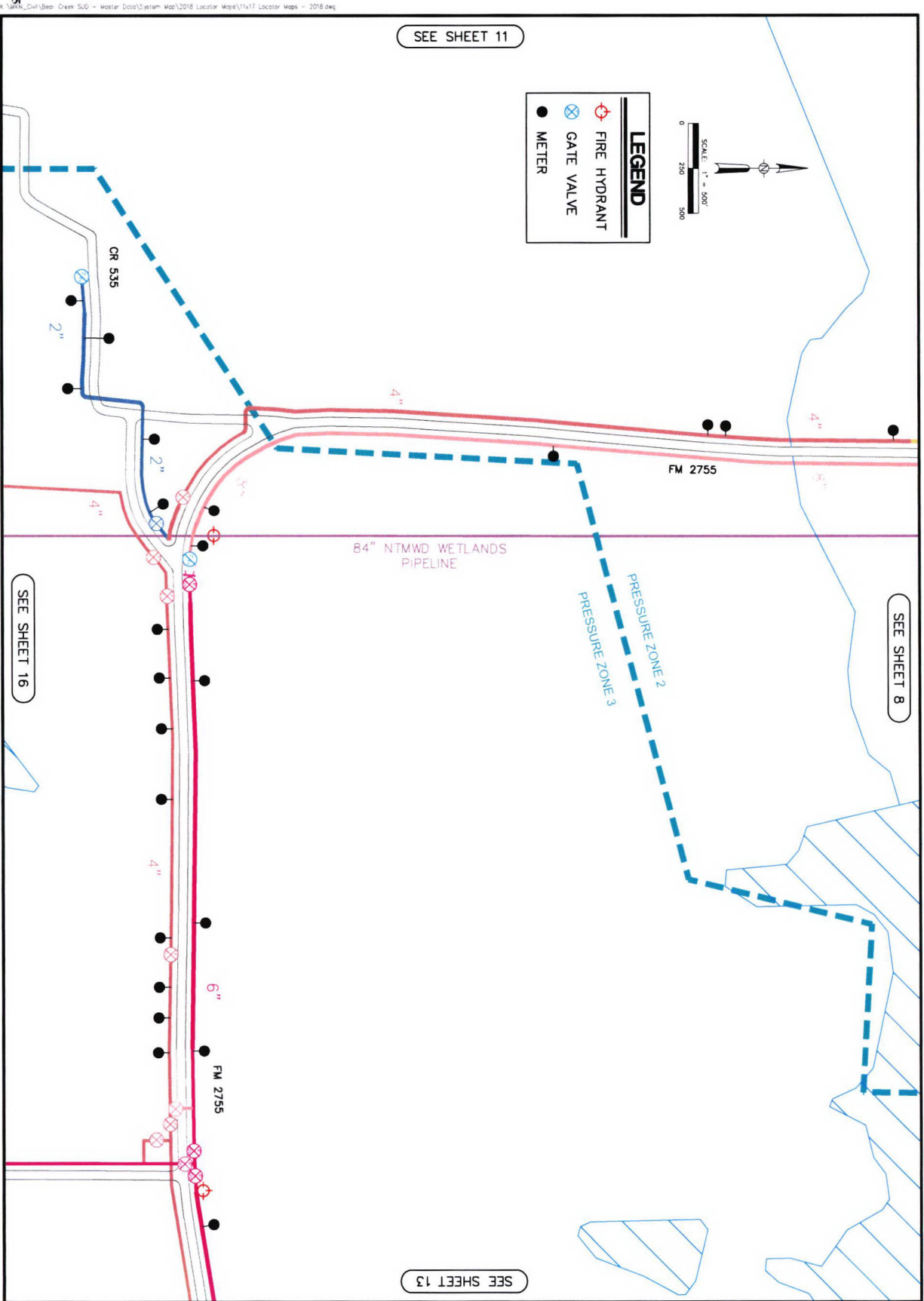
Kimley-Horn

100 West 10th Street, Suite 200, Oklahoma City, Oklahoma 73101
405-235-2500

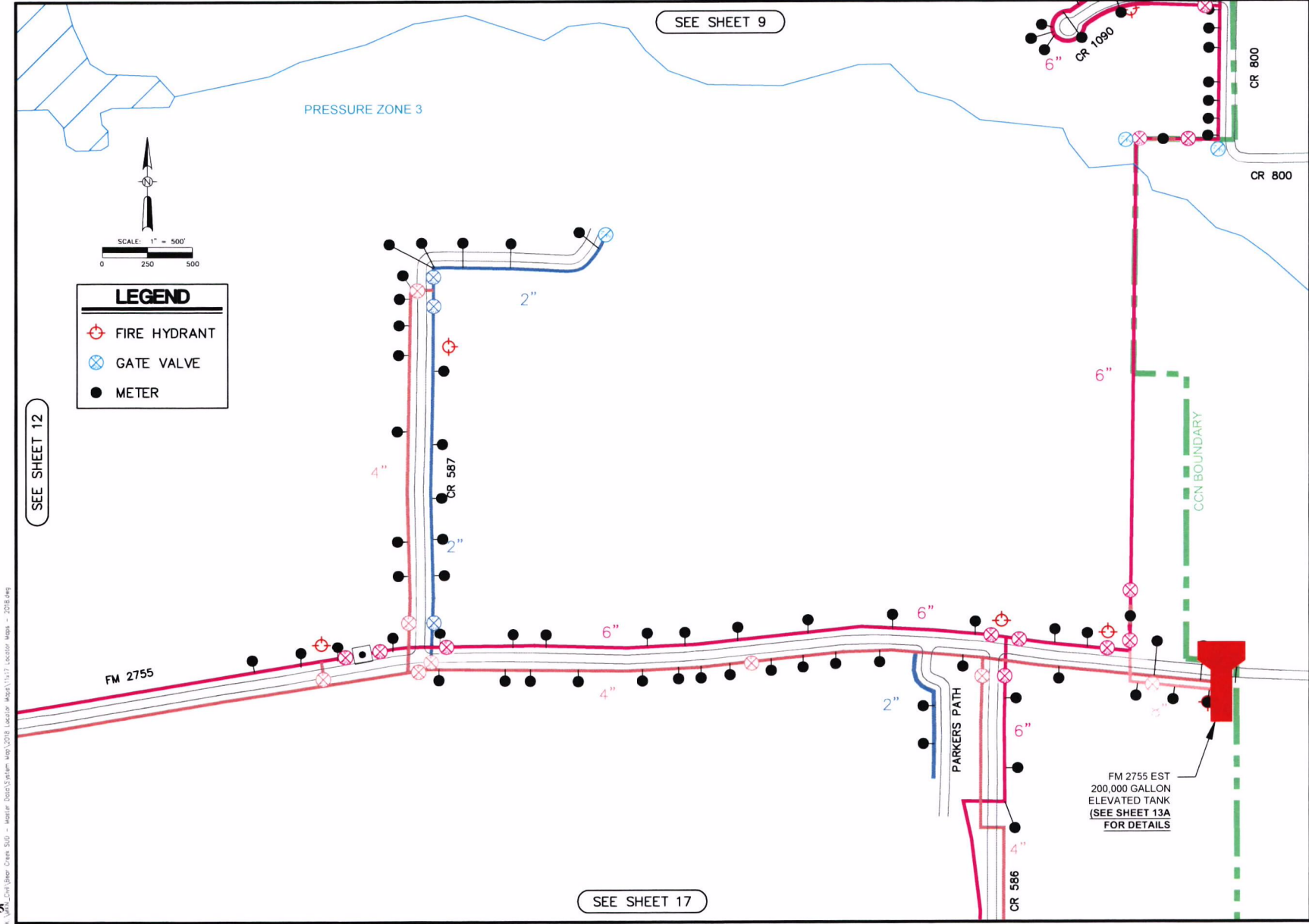
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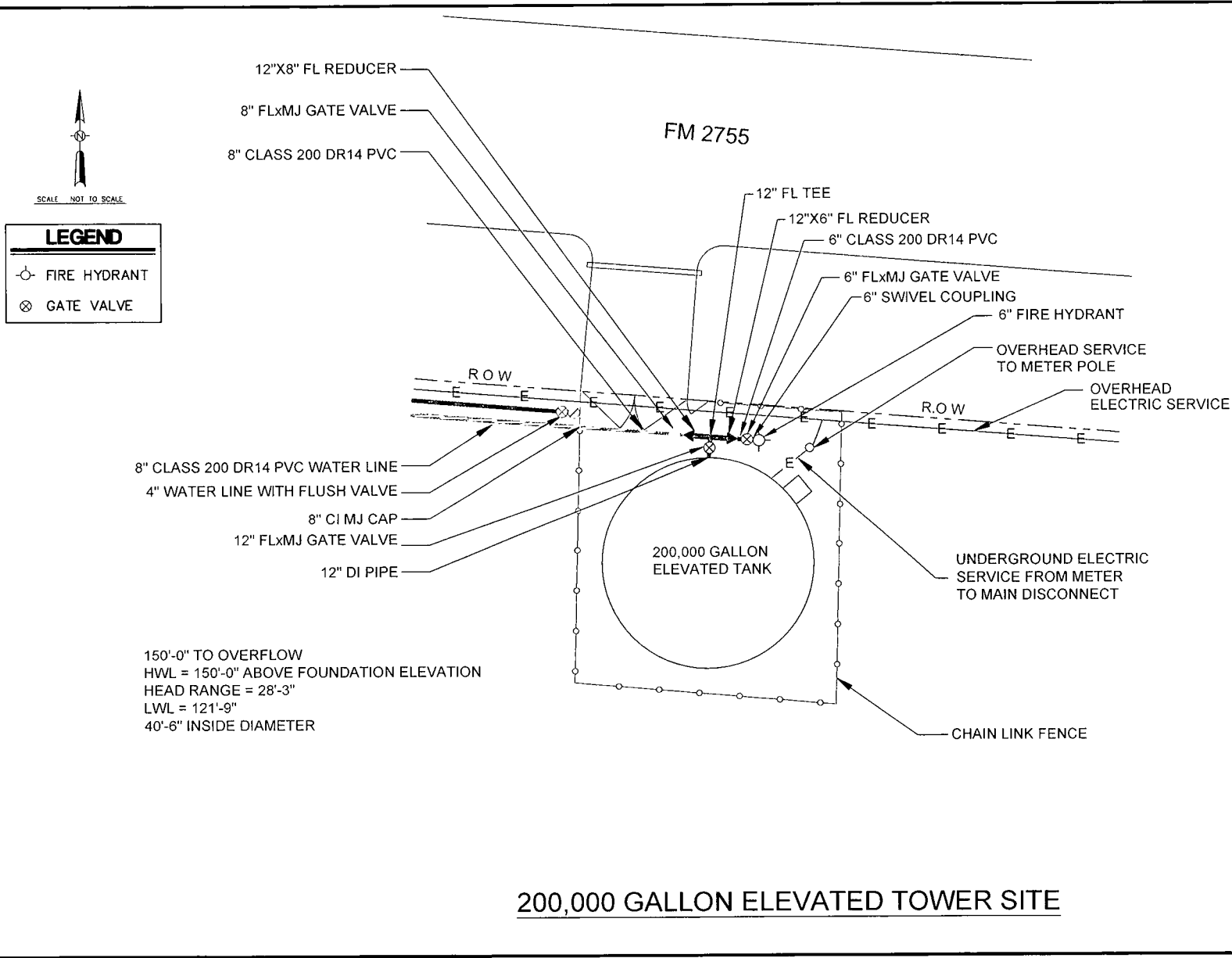
11 SHEET	DATE: JANUARY 2018	LOCATOR MAP #11	BEAR CREEK SUD SYSTEM LOCATOR MAP		Kimley»Horn <small>Texas Board of Professional Engineers (P.E. Registration Number: 7-828) 100 West Loop West, Suite 510, Houston, TX 77060 409-501-2500</small>
	DESIGN: SAW				
	DRAWN: DGD				
	CHECKED: JEH				
	NOHA NO: 064474157				



12 SHEET	DATE: JANUARY 2018	LOCATOR MAP #12	BEAR CREEK SUD SYSTEM LOCATOR MAP		Kimley»Horn <small>Texas Board Of Professional Engineers Firm Registration Number: F-828 100 West Louisiana St., Midland, TX 79701 409-307-2580</small>
	DESIGN: SAW				
	DRAWN: DGD				
	CHECKED: JEH				
	KHA NO.: 064474157				



 Kimley-Horn Team Based Engineering 100 West Loop West, Suite 1000, Houston, TX 77028 409.307.2000	 BEAR CREEK SUD	BEAR CREEK SUD SYSTEM LOCATOR MAP	
		LOCATOR MAP #13	
DATE: JANUARY 2018		DESIGN: SAW	13
DRAWN: DOD			
CHECKED: JFH			
KHA NO.: 06474157			



Kimley-Horn
Team Based Engineering
100 West University Street, Suite 200, Nashville, TN 37203
615-259-7200

BEAR CREEK SUD

BEAR CREEK SUD
 SYSTEM
 LOCATOR MAP

LOCATOR MAP #13A
 FM 2755 EST

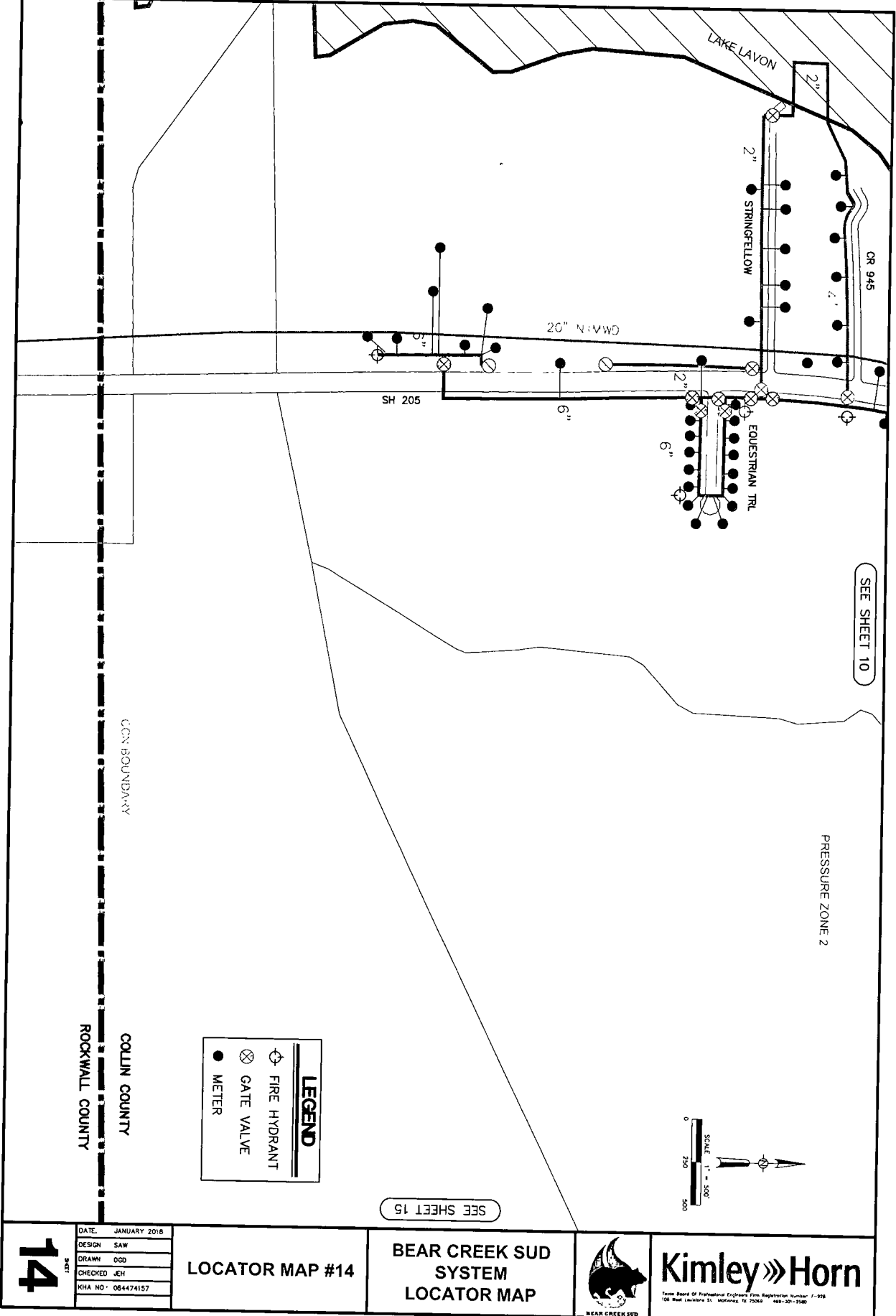
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DESIGN	SAW
DRAWN	ODD
CHECKED	EN
NOA NO	08474157

13A

Exhibit JH-2

Page 42 of 125

K:\2017\2017 Bear Creek SUD - Water\GIS\Map\2018 Locator Map\14141 Locator Map - 2018.dwg

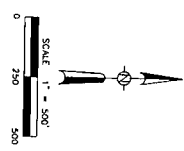


SEE SHEET 10

PRESSURE ZONE 2

LEGEND

- ⊕ FIRE HYDRANT
- ⊗ GATE VALVE
- METER

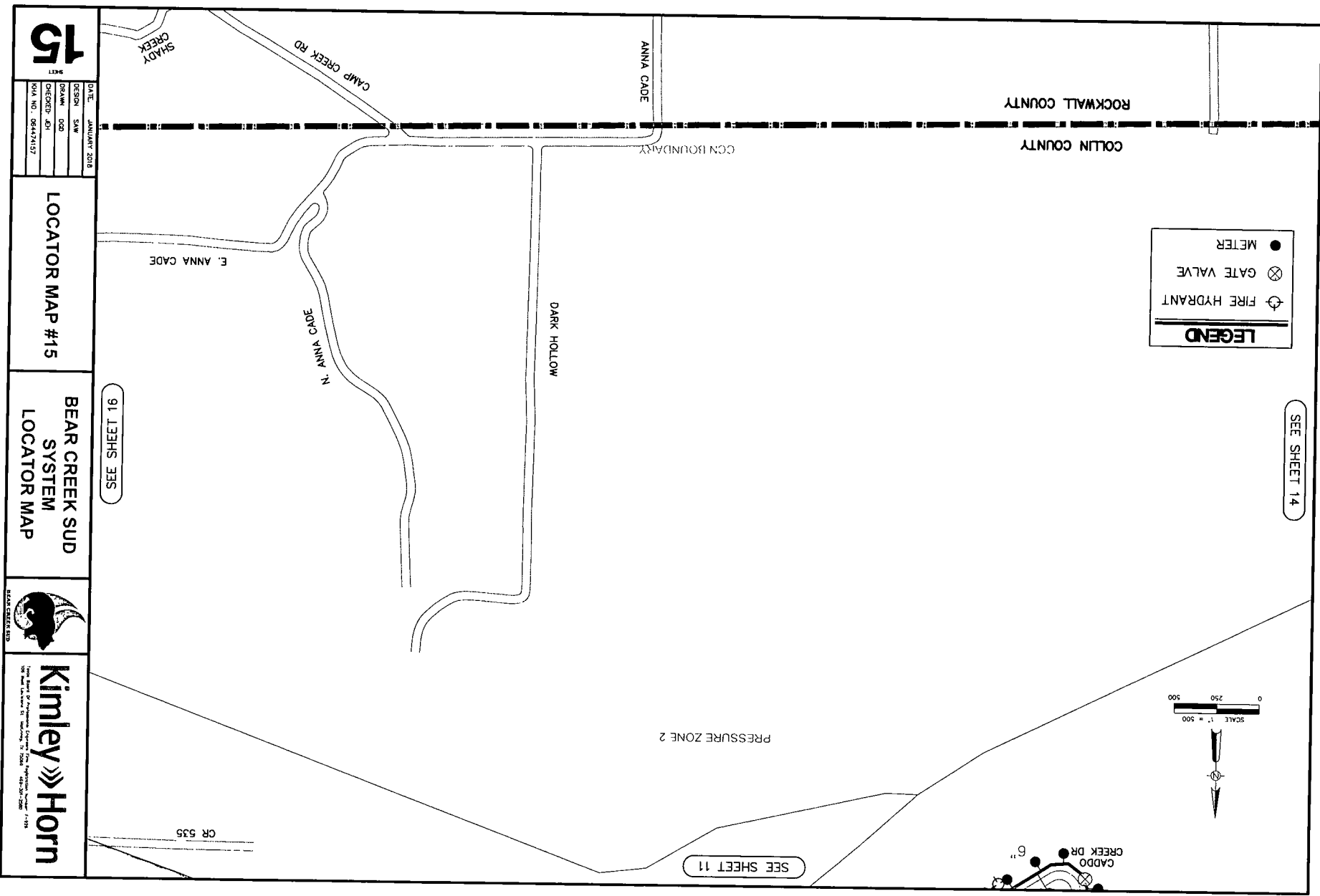


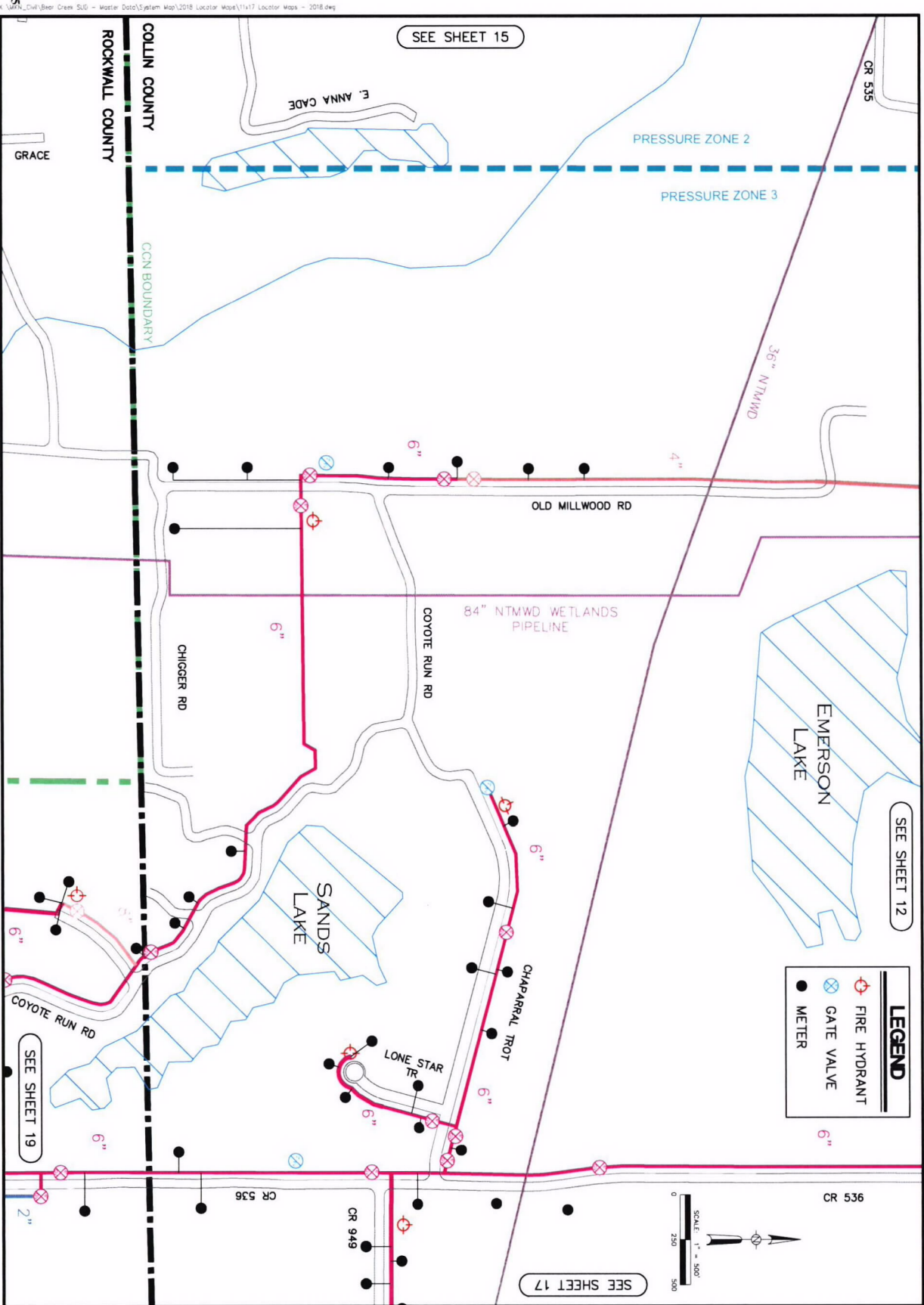
SEE SHEET 15

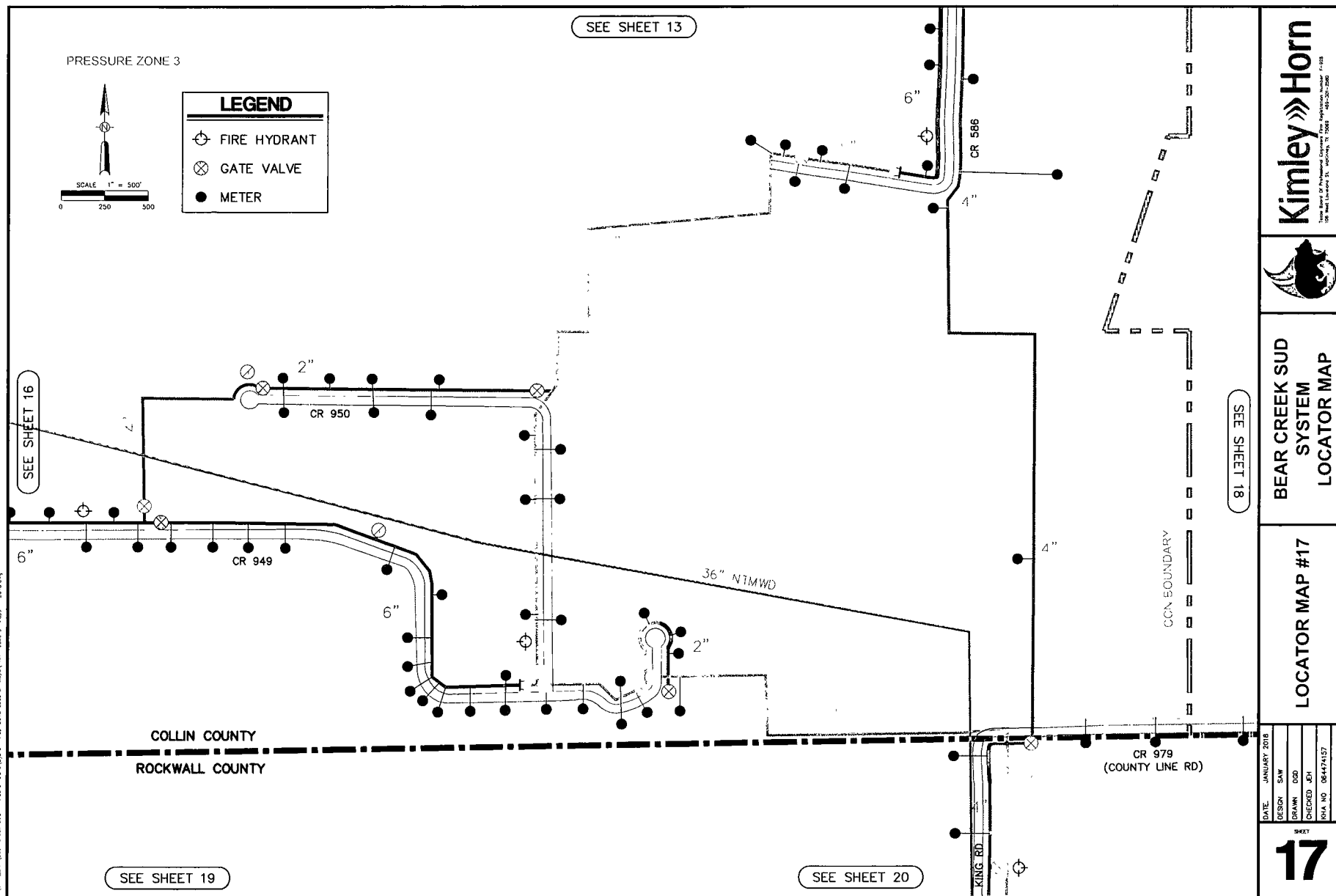
COLLIN COUNTY
ROCKWALL COUNTY

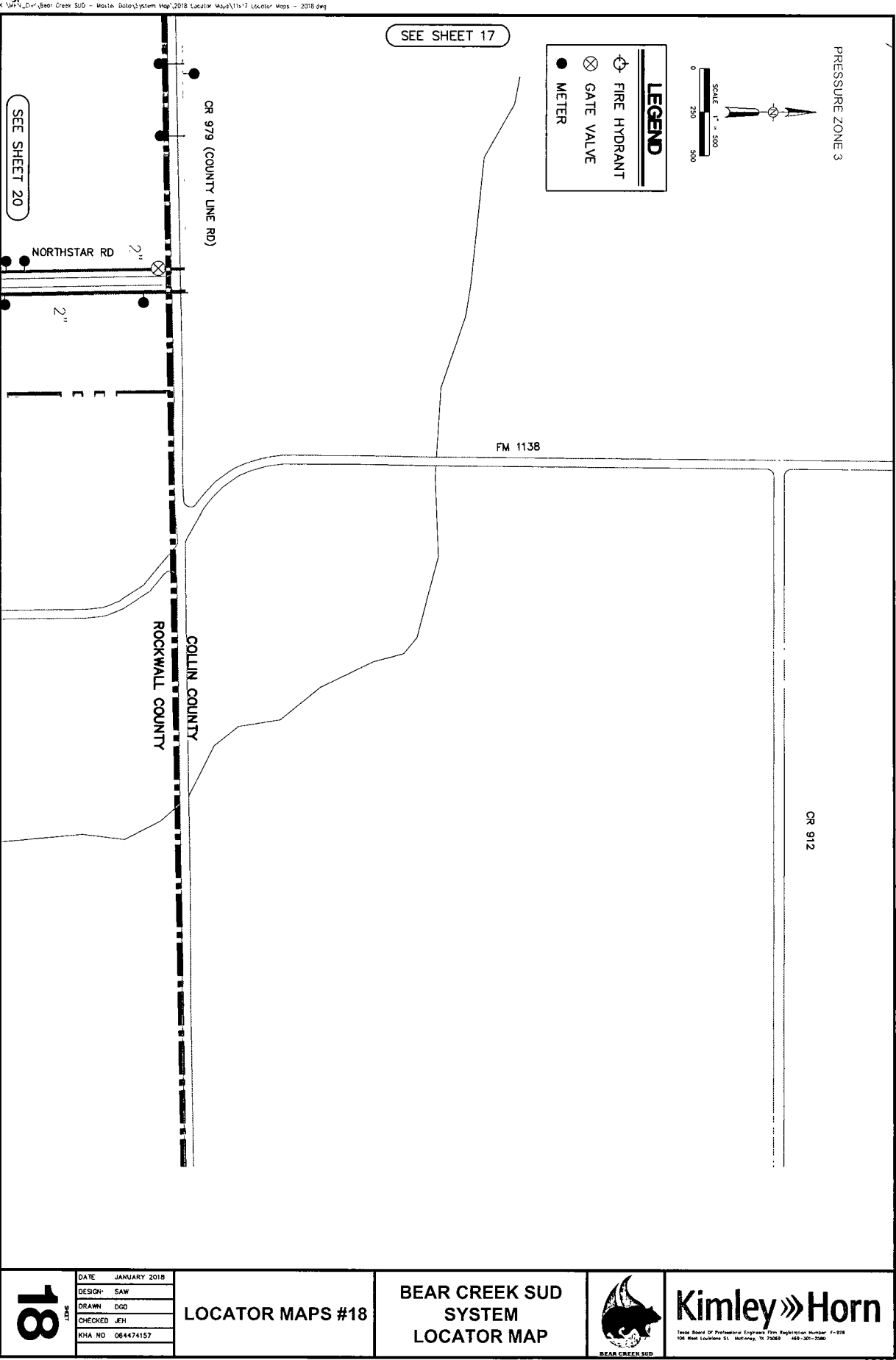
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	DRAWN: OGD				
	CHECKED: JEN				
	KHA NO: 064474157				

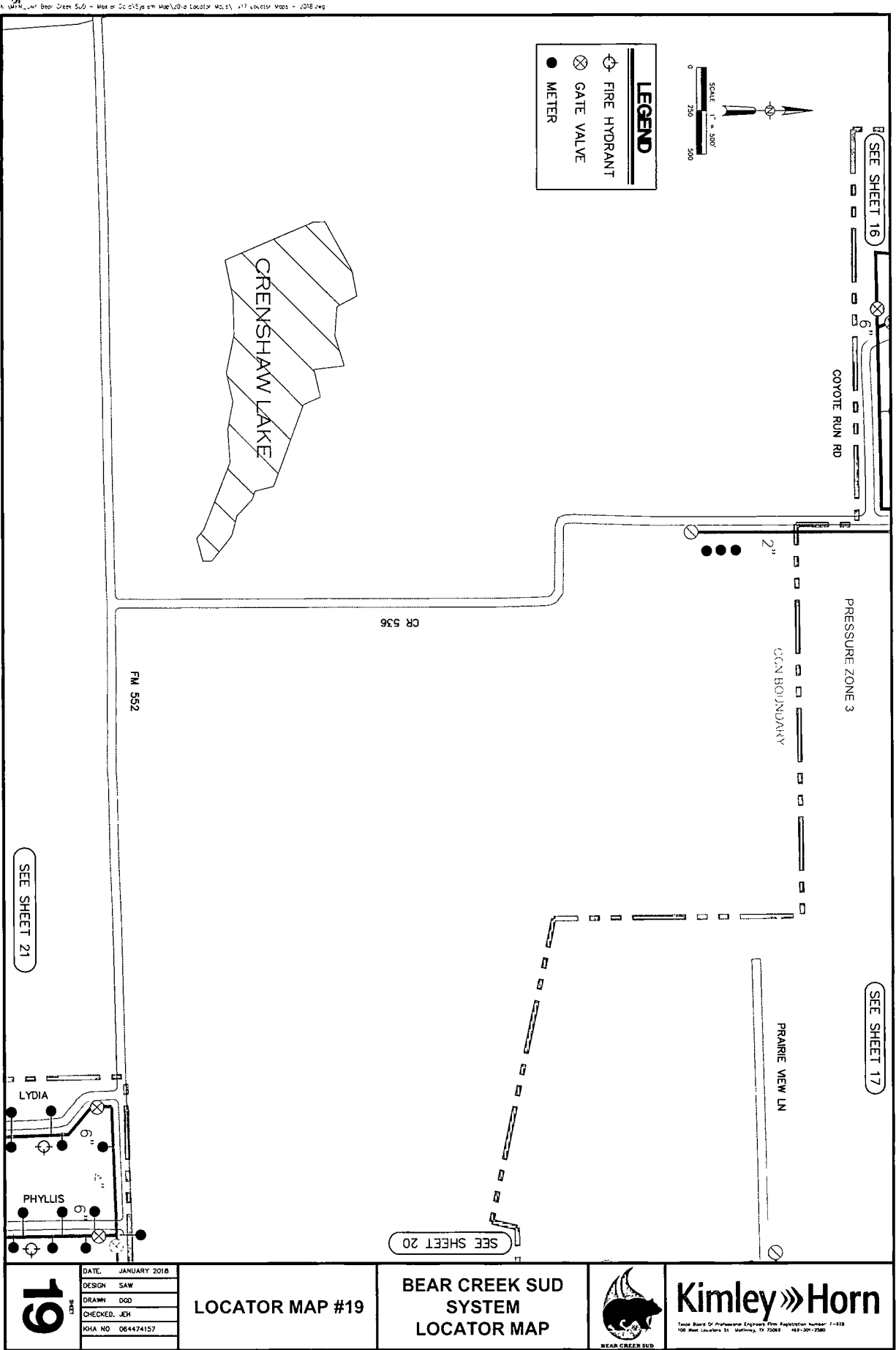
Exhibit JH-2











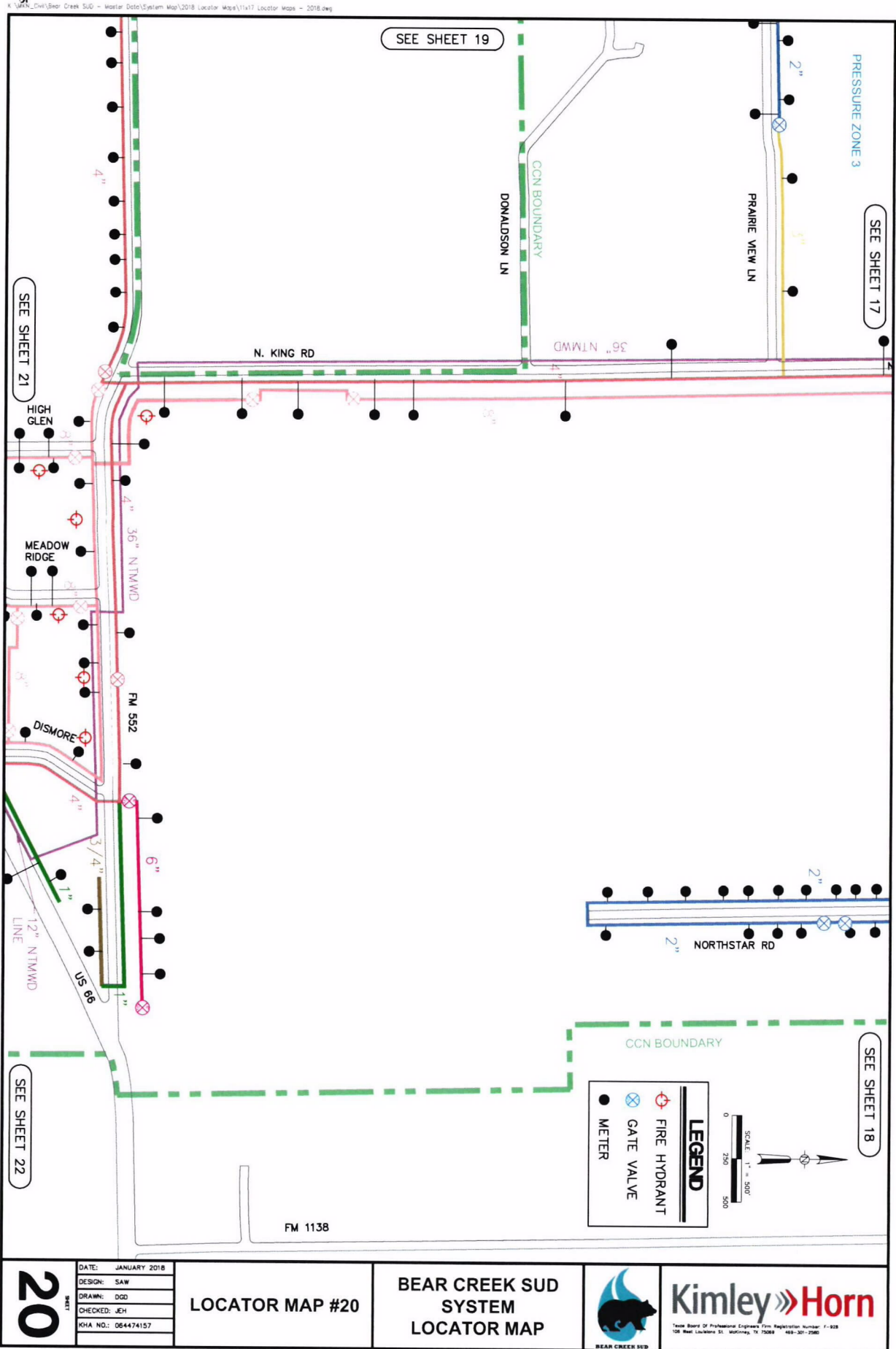
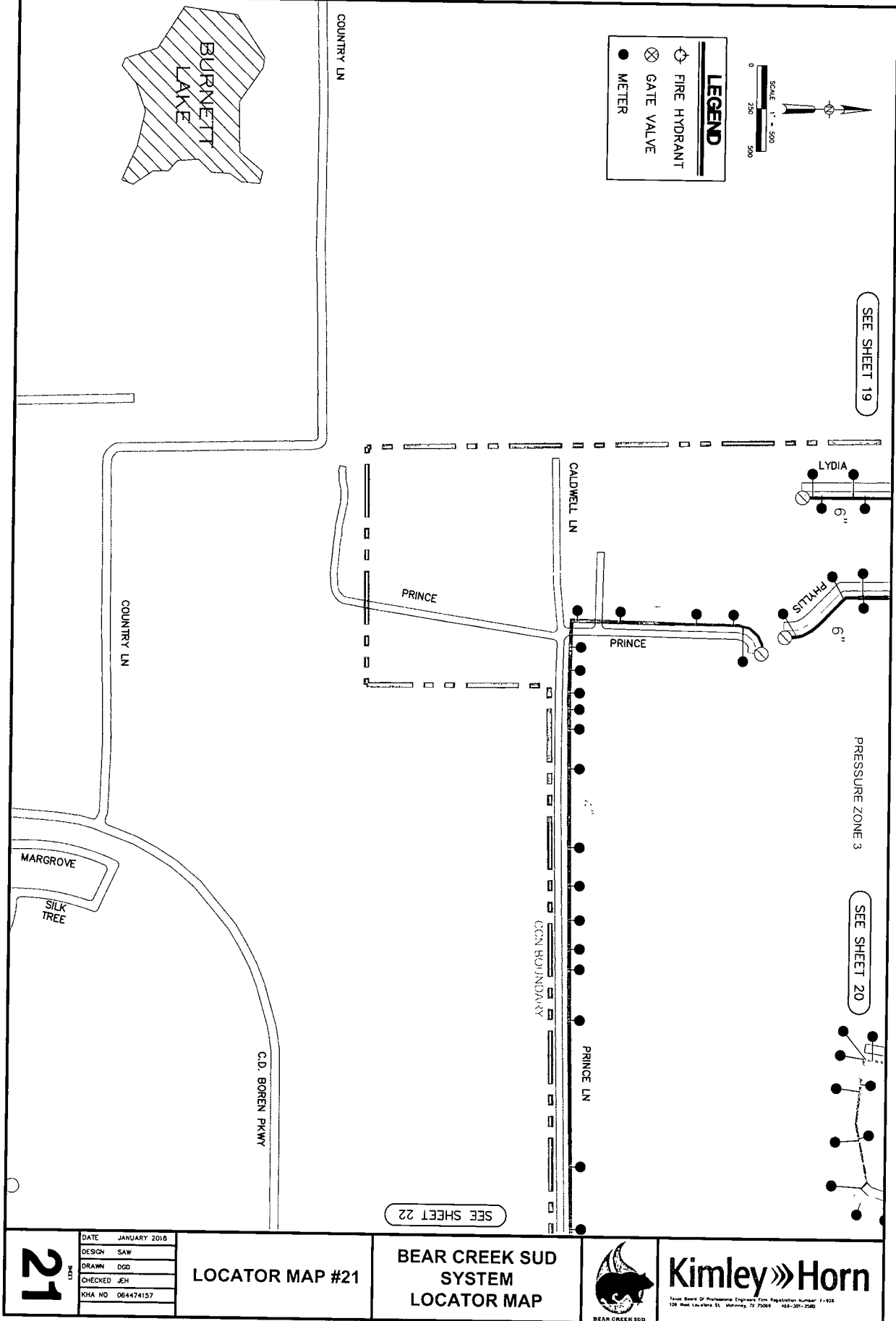


Exhibit JH-2

Page 49 of 125

K:\Projects\2018\Bore Creek Suds - Master Distribution Map\2018 Locust Map\1111 Locust Map - 2018.dwg



21

DATE	JANUARY 2018
DESIGN	SAW
DRAWN	DGD
CHECKED	JEH
KHA NO	064474157

LOCATOR MAP #21

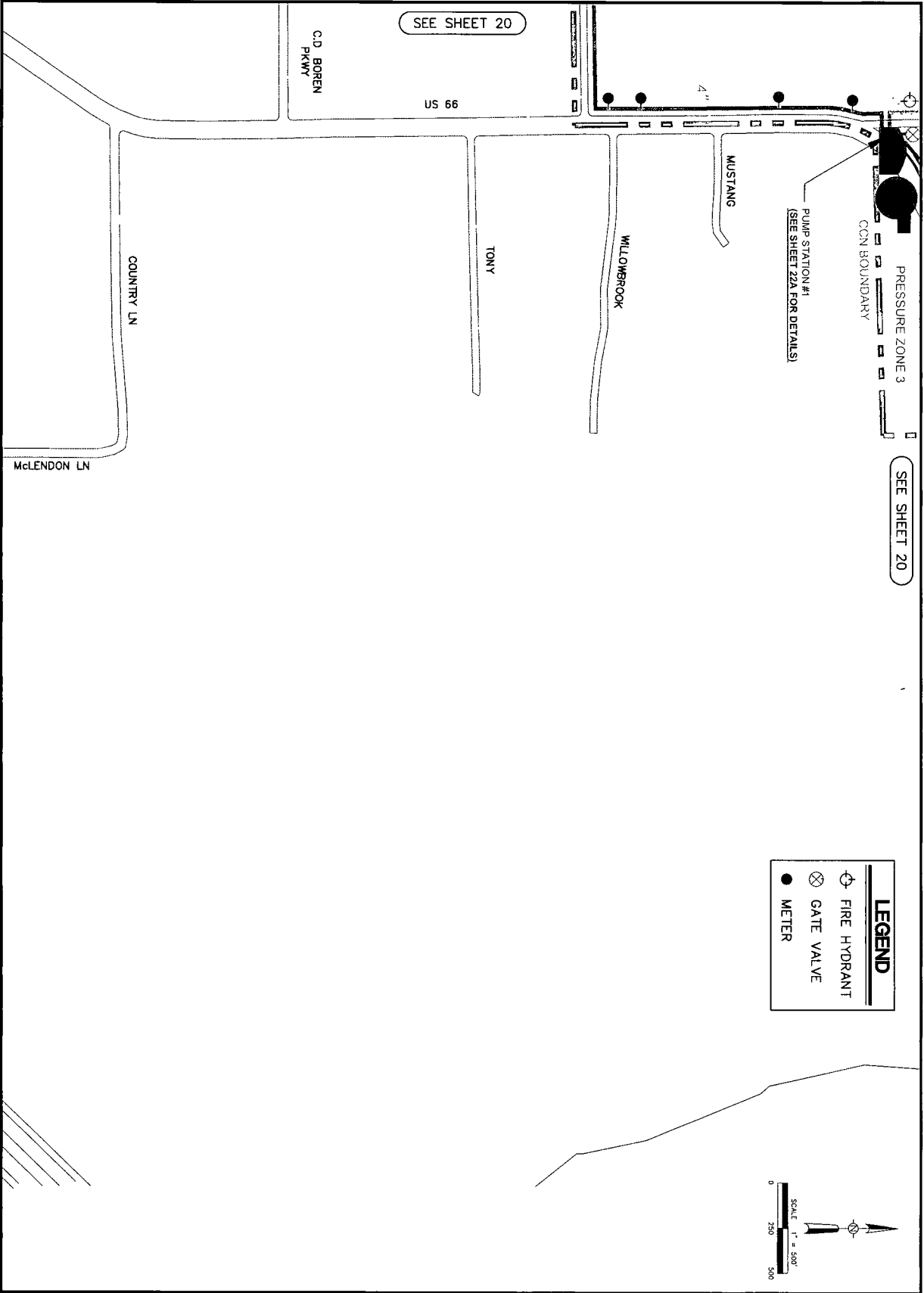
BEAR CREEK SUD
SYSTEM
LOCATOR MAP



Kimley»Horn

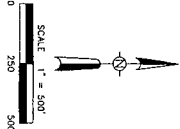
Travis Board of Professional Engineers Firm Registration Number: 1-924
100 West Louisiana St., Montgomery, AL 36104-2540

X:\Projects\Bearing Creek SUD - Master Data\System Map\2018 Locator Maps\1x17 Locator Maps - 2018.dwg



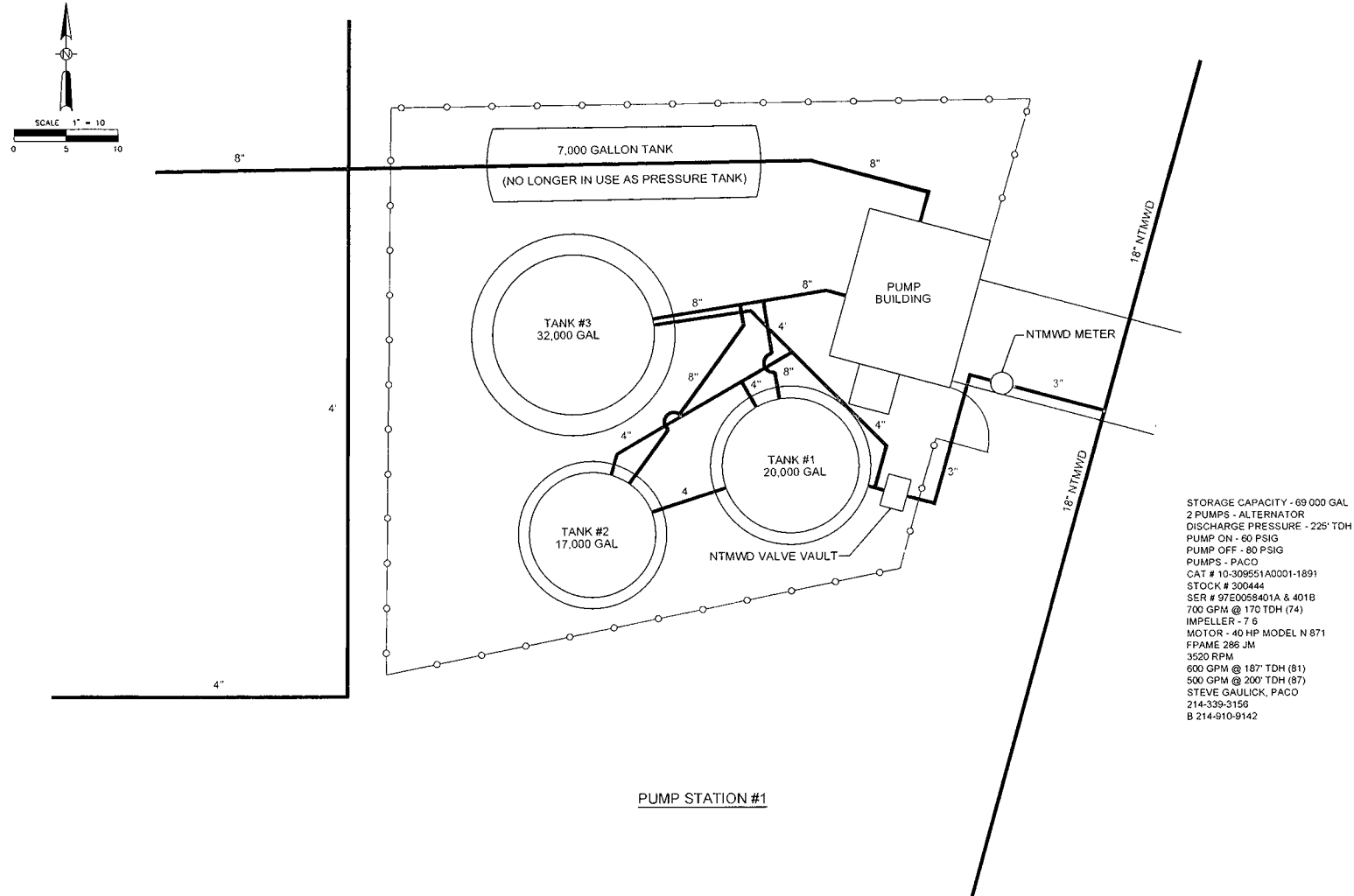
LEGEND

- ⊕ FIRE HYDRANT
- ⊗ GATE VALVE
- METER



22 SHEET	DATE	JANUARY 2018	LOCATOR MAP #22	BEAR CREEK SUD SYSTEM LOCATOR MAP		Kimley»Horn <small>Texas Board of Professional Engineers Firm Registration Number F-838 126 West Loop West Suite 511 McAllen, TX 78501 409-201-2500</small>
	DESIGN	SAW				
	DRAWN	DGD				
	CHECKED	JEH				
	KHA NO	064474157				

1. JH-2, City of Bear Creek S.D. - Bear Creek System Map, 2018, located at: 1100 N. 1st Street, Suite 100, Bear Creek, SD 57008



BEAR CREEK SUD SYSTEM LOCATOR MAP	
LOCATOR MAP #22A PUMP STATION #1	
DATE: JANUARY 2018 DESIGN: SAW DRAWN: DDD CHECKED: JH PWA NO: 08-474157	22A

Exhibit JH-3

Kimley»Horn

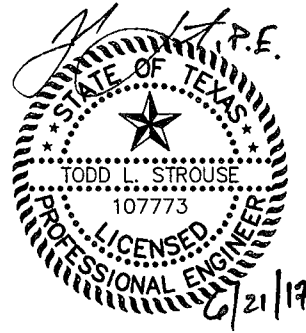
TECHNICAL MEMORANDUM

To: Camille Reagan
Bear Creek Special Utility District

From: Todd Strouse, P.E.
Kimley-Horn and Associates, Inc

Date June 21, 2017

Subject: Water Master Plan – Bear Creek Special Utility District



SUMMARY

Bear Creek Special Utility District (BCSUD) requested that Kimley-Horn evaluate their existing water system and develop a buildout Water Master Plan that included a Capital Improvement Plan (CIP) project list and associated costs for the various projects included.

For the purposes of this Water Master Plan, a new development density of 5 lots per acre on 80% of each available tract was used to determine the future number of connections in each of BCSUD's three existing pressure planes. Table 1 shows the existing and future numbers of connections that are projected for each pressure plane

Table 1 – Existing and Proposed Connections

Pressure Plane	Current Connections (2017)	Additional Connections to Buildout*	Total Buildout Connections
1	657	2,630	3,287
2	1,020	8,522	9,542
3	459	6,866	7,325
Total	2,136	18,018	20,154

*Please note that a specific year for buildout is not known

The existing system was modeled using Bentley Water CAD software in order to determine the necessary improvements needed to support the buildout growth expected. The projects identified will allow BCSUD to meet buildout system-wide peak hour flows, and will allow all future developments to provide 1,500 gallons per minute (gpm) fire flow for a two-hour duration. A total of twenty-two (22) projects have been identified that will be necessary to meet buildout demands at a total capital cost to construct of \$52,093,000, including survey and engineering.

DESIGN CRITERIA

Demand Allocation

Utilizing historical data provided by BCSUD and the current Alternative Capacity Requirement (ACR) approved by TCEQ, the average day demand for current customers is approximately 0.23 gpm / connection (0.56 gpm/connection for max day demand approved by TCEQ on August 24, 2015). Assuming 3 persons per connection, this equates to 110 gallons per capita per day (gpcd). Pumping records and elevated storage tank (EST) level records were not available; therefore, a peak hour to max day ratio of 1.25 was used in accordance with TCEQ chapter 290.

Existing tracts of land located inside the water CCN with no current water meter and some large tracts that currently have a water meter were identified as future developable tracts. Each tract is shown on the CIP exhibit located in Appendix 1 with a total acreage and a total percent of future demand for its respective pressure plane. The total number of connections assumed on each tract of land was assumed to be 80% of all land located outside of the current FEMA 100-year floodplain as shown graphically on an individual tract multiplied by a density of five units per acre.

Water Transmission Pipe Sizing

Pipes were sized in the distribution system to meet maximum day demands as well as to meet fire flow requirements. Pipe sizes were selected to limit velocities to a maximum of 8 ft/sec under maximum day demand scenarios and to meet minimum TCEQ pressure requirements.

Pumping Capacity

Pumping capacity for each pressure plane was evaluated to determine the pumps that will be necessary to meet peak hour or fire flow demands during a maximum day demand scenario. In each pressure plane, maximum day plus fire flow of 1,500 gallons per minute was greater than the peak hour of the maximum day as defined by TCEQ. Therefore, the maximum day plus fire flow scenario was the design flow for each pump station.

TCEQ chapter 290 requirements dictate that the pump station must be able to meet peak hour demands with the largest pump out of service. Future pump selections are based on meeting this requirement, as well as fire flow requirements. Table 2 summarizes the pump selections required for each pressure plane.

Table 2 – Buildout Pump Selections by Pressure Plane

Pressure Plane	Pump Selection	Pump Station #
1	4 – 1,200 gpm pumps	2
2	4 – 2,200 gpm pumps	2
3	4 – 1,700 gpm pumps	1

Ground Storage Tanks

Ground storage for each pressure plane at buildout was evaluated as part of this project. TCEQ Chapter 290 regulations give total storage requirements of 200 gallons per connection, but do not specify the percentage of this storage that must be ground storage. For the purposes of this study, Kimley-Horn recommends that 50% of maximum daily demand should be available as ground storage. The buildout ground storage identified in Table 3 will provide approximately 50% of the maximum daily demand for the respective pressure plane.

Table 3 – Proposed Ground Storage Tanks

Pressure Plane	Additional Ground Storage Tanks	Pump Station #
1	(1) – 1.0 MG Tank*	2
2	(2) – 2.0 MG Tanks*	2
3	(2) – 1.0 MG Tanks (1) – 0.5 MG Tank	1

*Additional land may need to be acquired at Pump Station #2 for future pumps and ground storage tanks.

Elevated Storage Tank Capacity

TCEQ Chapter 290 requires a minimum of 100 gallons per connection for elevated storage capacity. This criteria was utilized as a baseline to determine the adequacy of the existing elevated storage tanks in the system, however, other factors such as retaining a 2-hour fire-fighting reserve, and the daily tank cycling were also evaluated.

The existing 400,000 gallon elevated storage tank (EST) in Pressure Plane #1 will be adequate to serve through buildout as long as scheduled maintenance is performed and the tank is in good operating condition. Pressure Plane #2 will require an additional 1.5 MG of EST capacity. The location of the proposed tank is shown on the CIP exhibit in Appendix 1. It is assumed that the existing 300,000 gallon tank will stay in service when the new tank comes online, and the existing 200,000 gallon tank will be taken out of service and demolished. Pressure Plane #3 will require an additional 1 MG EST. The existing 200,000 gallon tank that serves Pressure Plane #3 currently is expected to stay online through buildout. Table 4 summarizes the elevated storage tanks that are proposed for each Pressure Plane.

Table 4 – Proposed Elevated Storage Tanks

Pressure Plane	Existing Elevated Storage Tanks	Proposed Elevated Storage Tanks
1	(1) – 400,000 gal Tank	N/A
2	(1) – 300,000 gal Tank (1) – 200,000 gal Tank	1,500,000 gal
3	(1) – 200,000 gal Tank	1,000,000 gal

Exhibit JH-3



Page 4

SUMMARY

Future water demands and water infrastructure necessary to meet these demands were evaluated as part of this study. Twenty-two different CIP projects have been identified to meet this demand from now until buildout of the water service area. The total cost of all improvements including survey and engineering is estimated to be \$52,093,000. Individual project OPCC's can be found in Appendix 2 of this memo. Appendix 1 shows a map with all projects that have been identified and each future tract of land to be developed assumed future demand contributions.

Thank you for the opportunity to be of service to BCSUD. If you have any questions, please do not hesitate to contact me directly.

A handwritten signature in black ink, appearing to read "T. Strouse, P.E.", with a stylized flourish at the end.

Todd Strouse, P.E.

Kimley-Horn & Associates, Inc
106 West Louisiana Street
McKinney, Texas 75069
(469) 301-2592

Attachments:

Appendix 1 – CIP Project Map

Appendix 2 – Opinions of Probable Construction Costs (OPCC's)

Exhibit JH-3

Kimley»Horn

APPENDIX 1 CIP PROJECT MAP

Exhibit JH-3

1" = 1000'

LEGEND

- EXISTING WATER LINE
- CIP WATER LINE
- CCN BOUNDARY
- PRESSURE ZONE
- BOUNDARY
- COUNTY LINE
- PUMP STATION
- GROUND STORAGE TANK
- PROPOSED ELEVATED STORAGE TANK
- EXISTING ELEVATED STORAGE TANK
- FUTURE PARCEL TO BE DEVELOPED (TOTAL LAND AREA SHOWN)
- CIP PROJECT NUMBER (SEE BOTTOM OF MAP)
- FEMA 100-YEAR FLOODPLAIN

PRESSURE ZONE #2

TRACT NUMBER	FUTURE CONNECTIONS	FUTURE DEMAND CONTRIBUTION PERCENTAGE
8	1,340	15.3%
9	952	11.2%
10	728	8.5%
11	1,220	14.3%
12	96	1.1%
13	1,728	20.3%
14	1057	12.4%
15	162	1.9%
16	520	6.2%
19	218	2.6%
20	181	2.1%
21	347	4.1%

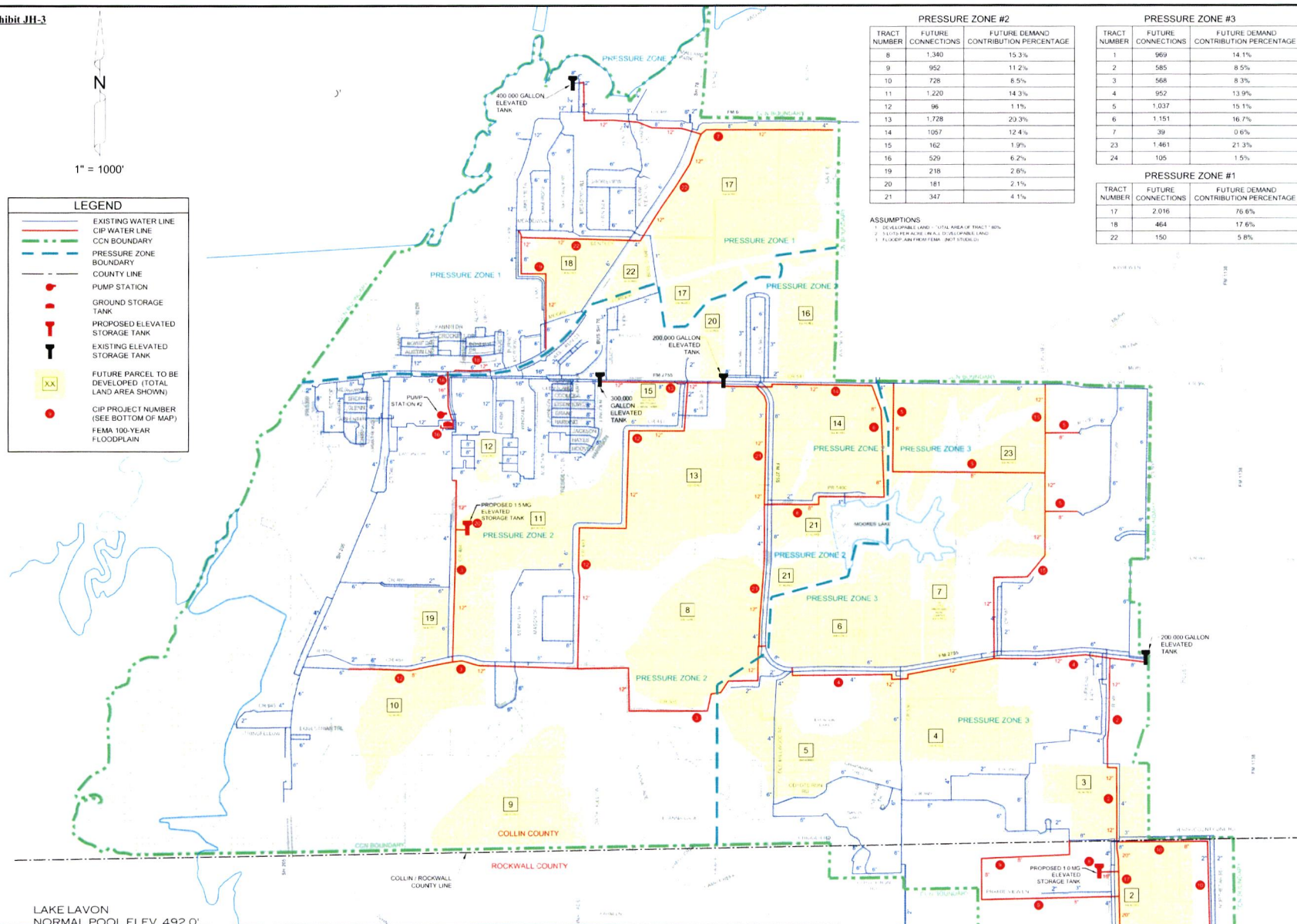
PRESSURE ZONE #3

TRACT NUMBER	FUTURE CONNECTIONS	FUTURE DEMAND CONTRIBUTION PERCENTAGE
1	969	14.1%
2	585	8.5%
3	568	8.3%
4	952	13.9%
5	1,037	15.1%
6	1,151	16.7%
7	39	0.6%
23	1,461	21.3%
24	105	1.5%

PRESSURE ZONE #1

TRACT NUMBER	FUTURE CONNECTIONS	FUTURE DEMAND CONTRIBUTION PERCENTAGE
17	2,016	76.6%
18	464	17.6%
22	150	5.8%

ASSUMPTIONS
 1. DEVELOPABLE LAND - TOTAL AREA OF TRACT - 60%
 2. EXISTING PARCEL AREA - 40% DEVELOPABLE LAND
 3. FUTURE PARCEL AREA - 10% DEVELOPABLE LAND



WATER CAPITAL IMPROVEMENT PROJECT (CIP) MAP

PROJECT LIST

1. PUMP STATION #1 UPGRADES
 - 1.1. PHASE 1 - 0.5 MG GST & (2) - 400 GPM PUMPS
 - 1.2. PHASE 2 - 1 MG GST & (2) - 700 GPM PUMPS
 - 1.3. PHASE 3 - 1 MG GST & (4) - 1,700 GPM PUMPS
2. CR 586 12" WATER LINE
3. CR 483, CR 484 AND CR 535 12" WATER LINE
4. FM 2755 12" WATER LINE
5. CR 541 8" WATER LINE
6. PR 5400 8" WATER LINE
7. CR 486 12" WATER LINE
8. PRAIRIE VIEW LANE 1.0 MG ELEVATED STORAGE TANK
9. PRAIRIE VIEW LANE 8" WATER LINE
10. NORTHSTAR ROAD 8" WATER LINE
11. PRINCE LN 8" WATER LINE
12. CR 483 12" & 8" WATER LINE
13. FM 2755 12" WATER LINE
14. CR 541 12" WATER LINE
15. CR 587 12" WATER LINE
16. PUMP STATION #2 UPGRADES
- 16.1 PRESSURE PLANE #1
 - 16.1.1 (1) - 1 MG GST
 - 16.1.2 (4) - 1,200 GPM PUMPS
- 16.2 PRESSURE PLANE #2
 - 16.2.1 (2) - 2 MG GST'S
 - 16.2.2 (4) - 2,200 GPM PUMPS
17. KING ROAD 20" WATER LINE
18. PUMP STATION #2 - PRESSURE PLANE #1 - 16-INCH AND 12-INCH WATER LINE
19. CR 486 12" WATER LINE
20. CR 484 1.5 MG ELEVATED STORAGE TANK
21. FM 2755 12" WATER LINE
22. HIGHWAY 78 12" WATER LINE

Kimley Horn

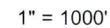
106 WEST LOUISIANA STREET, MC KINNEY, TX 75069
 PHONE: 469.301.2555
 WWW.KIMLEY-HORN.COM TX-1-928



BEAR CREEK SUD

1001 E. 1st St., Suite 100
 Lewisville, Texas 75056
 Phone: 972.454.4300 Fax: 972.454.4301
 Phone: 972.454.4301 Fax: 972.454.4301

Updated June 2017



PRESSURE ZONE #1

ASSUMPTIONS:

- 1 DEVELOPABLE LAND = TOTAL AREA OF TRACT * 80%
- 2 5 LOTS PER ACRE ON ALL DEVELOPABLE LAND
- 3 FLOODPLAIN FROM FEMA - (NOT STUDIED)

PROJECT LIST



16881 C R 541	P.O. Box 180
Lavon, Texas 75146	Lavon, Texas 75146
TEL 972-943-2101	TEL 972-943-2101
Fax 972-853-2906	Fax 972-853-2906

- | | | | |
|----|---|--------|---------------------------------------|
| 1 | PUMP STATION #1 UPGRADES | 14 | CR 541 12" WATER LINE |
| 1 | 1. PHASE 1 - 0.5 MG GST & (2) - 400 GPM PUMPS | 15 | CR 587 12" WATER LINE |
| 2 | 2. PHASE 2 - 1 MG GST & (2) - 700 GPM PUMPS | 16 | PUMP STATION #2 UPGRADES |
| 3 | 3. PHASE 3 - 1 MG CR & (4) - 700 GPM PUMPS | 17 | 2. PRESSURE PLANE #1 |
| 4 | CR 586 12" WATER LINE | 16.1 | 1.1 - 1 MG GST |
| 5 | CR 483, CR 484, AND CR 535 12" WATER LINE | 16.1.2 | 1.2 (4) - 1,200 GPM PUMPS |
| 6 | FM 2755 12" WATER LINE | 16.2 | 2 PRESSURE PLANE #2 |
| 7 | CR 541 8" WATER LINE | 16.2.1 | 2.1 (2) - 2 MG GSTS |
| 8 | PR 5400 8" WATER LINE | 16.2.2 | 2.2 (4) - 2,200 GPM PUMPS |
| 9 | CR 486 12" WATER LINE | 17 | KING ROAD 20" WATER LINE |
| 10 | PR 5400 8" WATER LINE | 18 | PUMP STATION #3 UPGRADES |
| 11 | PR 5400 8" WATER LINE | 18.1 | #1 - 16" INCH AND 12" INCH WATER LINE |
| 12 | PR 5400 8" WATER LINE | 18 | CR 486 12" WATER LINE |
| 13 | PR 5400 8" WATER LINE | 20 | CR 484 1.5 MG ELVATED STORAGE TANK |
| 14 | PR 5400 8" WATER LINE | 21 | FM 2755 12" WATER LINE |
| 15 | PR 5400 8" WATER LINE | 22 | HIGHWAY 78 12" WATER LINE |

106 WEST LOUISIANA STREET, MCKINNEY, TX 75069
PHONE: 469-301-2585
WWW.KIMLEY-HORN.COM TX F-928

Exhibit JH-3

WATER CAPITAL IMPROVEMENT PROJECT (CIP) MAP PRESSURE ZONE #2

PROJECT LIST

1. PUMP STATION #1 UPGRADES
 - 1.1 PHASE 1 - 0.5 MG GST & (2) - 400 GPM PUMPS
 - 1.2 PHASE 2 - 1 MG GST & (2) - 700 GPM PUMPS
 - 1.3 PHASE 3 - 1 MG GST & (4) - 1,700 GPM PUMPS
2. CR 586 12" WATER LINE
3. CR 483, CR 484, AND CR 535 12" WATER LINE
4. FM 2755 12" WATER LINE
5. CR 541 8" WATER LINE
6. PR 5400 8" WATER LINE
7. CR 486 12" WATER LINE
8. PRAIRIE VIEW LANE 1.0 MG ELEVATED STORAGE TANK
9. PRAIRIE VIEW LANE 8" WATER LINE
10. NORTHSTAR ROAD 8" WATER LINE
11. PRINCE LN 8" WATER LINE
12. CR 483 12" & 8" WATER LINE
13. FM 2755 12" WATER LINE
14. CR 541 12" WATER LINE
15. CR 587 12" WATER LINE
16. PUMP STATION #2 UPGRADES
 - 16.1 PRESSURE PLANE #1
 - 16.1.1 (1) - 1 MG GST
 - 16.1.2 (4) - 1,200 GPM PUMPS
 - 16.2 PRESSURE PLANE #2
 - 16.2.1 (2) - 2 MG GSTS
 - 16.2.2 (4) - 2,200 GPM PUMPS
17. KING ROAD 20" WATER LINE
18. PUMP STATION #2 - PRESSURE PLANE #1 - 16-INCH AND 12-INCH WATER LINE
19. CR 486 12" WATER LINE
20. CR 484 1.5 MG ELEVATED STORAGE TANK
21. FM 2755 12" WATER LINE
22. HIGHWAY 78 12" WATER LINE

Updated June 2017

BEAR CREEK SUD

8800 CR 341 P.O. Box 180
Lubbock, Texas 79406
TEL: 872-942-2101 TEL: 872-943-2101
Fax: 872-952-2306 Fax: 872-952-2305

PRESSURE ZONE #2

TRACT NUMBER	FUTURE CONNECTIONS	FUTURE DEMAND CONTRIBUTION PERCENTAGE
8	1,340	15.3%
9	952	11.2%
10	728	8.5%
11	1,220	14.3%
12	96	1.1%
13	1,728	20.3%
14	1,057	12.4%
15	162	1.9%
16	529	6.2%
19	218	2.6%
20	181	2.1%
21	347	4.1%

ASSUMPTIONS:

1. DEVELOPABLE LAND - TOTAL AREA OF TRACT - 80%
2. 5 LOTS PER ACRE ON ALL DEVELOPABLE LAND
3. FLOODPLAIN FROM FEMA - (NOT STUDIED)

LEGEND

- EXISTING WATER LINE
- CIP WATER LINE
- CCN BOUNDARY
- PRESSURE ZONE BOUNDARY
- COUNTY LINE
- PUMP STATION
- GROUND STORAGE TANK
- PROPOSED ELEVATED STORAGE TANK
- EXISTING ELEVATED STORAGE TANK
- FUTURE PARCEL TO BE DEVELOPED (TOTAL LAND AREA SHOWN)
- CIP PROJECT NUMBER (SEE BOTTOM OF MAP)
- FEMA 100-YEAR FLOODPLAIN

Kimley»Horn

106 WEST LOUISIANA STREET, MCKINNEY, TX 75069
PHONE: 469-301-2585
WWW.KIMLEY-HORN.COM TX F-928

1" = 1000'

Exhibit JH-3

Kimley»Horn

APPENDIX 2

OPINIONS OF PROBABLE CONSTRUCTION COSTS (OPCC'S)

Exhibit JH-3

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 6/21/2017
Project: Water CIP Plan	Prepared By: SAW
KHA No.: 064474143	Checked By: TLS

Title: CIP Project Summary	Sheet: 1 of 26
----------------------------	----------------

Project	Item Cost
Project 1 1 - Pump Station #1 - Phase 1 Upgrades - 0.5 MG GST & (2) - 400 gpm pumps	\$ 2,671,000
Project 1.2 - Pump Station #1 - Phase 2 Upgrades - 1 MG GST & (2) - 700 gpm pumps	\$ 1,914,000
Project 1.3 - Pump Station #1 - Phase 3 Upgrades - 1 MG GST & (4) - 1,700 gpm pumps	\$ 1,992,000
Project 2 - CR 586 12-inch Water Line	\$ 1,363,000
Project 3 - CR 483, CR 484, and CR 535 12" Water Line	\$ 3,562,000
Project 4 - FM 2755 12" Water Line	\$ 2,001,000
Project 5 - CR 541 8" Water Line	\$ 369,000
Project 6 - PR 5400 8" Water Line	\$ 1,171,000
Project 7 - CR 486 12" Water Line	\$ 1,777,000
Project 8 - Prairie View Lane - 1.0 MG Elevated Storage Tank	\$ 3,275,000
Project 9 - Prairie View Lane 8" Water Line	\$ 1,424,000
Project 10 - Northstar Road 8" Water Line	\$ 1,731,000
Project 11 - Prince Lane 8" Water Line	\$ 1,340,000
Project 12 - CR 483 12" & 8" Water Line	\$ 2,777,000
Project 13 - FM 2755 12" Water Line	\$ 723,000
Project 14 - CR 541 12" Water Line	\$ 892,000
Project 15 - CR 587 12" Water Line	\$ 1,873,000
Project 16 1 - Pump Station #2 - Pressure Plane #1 Upgrades	\$ 1,978,000
Project 16 2 - Pump Station #2 - Pressure Plane #2 Upgrades	\$ 6,618,000
Project 17 - King Road 20-inch Water Line	\$ 2,741,000
Project 18 - Pump Station #2 - Pressure Plane #1 - 16-inch and 12-inch Water Line	\$ 1,023,000
Project 19 - CR 486 12" Water Line	\$ 875,000
Project 20 - CR 484 1.5 MG Elevated Storage Tank	\$ 4,950,000
Project 21 - FM 2755 12" Water Line	\$ 1,588,000
Project 22 - HWY 78 12" Water Line	\$ 1,465,000
Basis for Cost Projection:	Subtotal \$ 52,093,000
<input checked="" type="checkbox"/> No Design Completed	Total: \$ 52,093,000
<input type="checkbox"/> Preliminary Design	
<input type="checkbox"/> Final Design	

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable construction costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Exhibit JH-3

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 6/21/2017
Project: Water CIP Plan	Prepared By: SAW
KHA No.: 064474143	Checked By: TLS

Title: Project 1.1 - Pump Station #1 - Phase 1 Upgrades - 0.5 MG GST & (2) - 400 gpm pumps	Sheet: 2 of 26
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Site Work	1	LS	\$ 484,000	\$ 484,000
2	Landscaping	1	LS	\$ 134,000	\$ 134,000
3	Yard Piping	1	LS	\$ 215,000	\$ 215,000
4	Pump Station	1	LS	\$ 432,000	\$ 432,000
5	Control Valve Vault	1	LS	\$ 178,000	\$ 178,000
6	Ground Storage Tank	1	LS	\$ 714,000	\$ 714,000
7	Electrical	1	LS	\$ 514,000	\$ 514,000

Basis for Cost Projection:

- ☐ No Design Completed
☐ Preliminary Design
☒ Final Design

Subtotal	\$ 2,671,000
Total:	\$ 2,671,000

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Exhibit JH-3

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 6/21/2017
Project: Water CIP Plan	Prepared By: SAW
KHA No.: 064474143	Checked By: TLS

Title: Project 1.2 - Pump Station #1 - Phase 2 Upgrades - 1 MG GST & (2) - 700 gpm pumps	Sheet: 3 of 26
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 63,000	\$ 63,000
2	1 0 MG Ground Storage Tank	1	LS	\$ 1,100,000	\$ 1,100,000
3	700 gpm pump	2	EA	\$ 7,000	\$ 14,000
4	Excavation & Backfill	1	LS	\$ 85,000	\$ 85,000
5	Mixer	1	LS	\$ 8,000	\$ 8,000
6	Electrical & SCADA	1	LS	\$ 50,000	\$ 50,000

Basis for Cost Projection:

- ☐ No Design Completed
☐ Preliminary Design
☐ Final Design

Subtotal	\$ 1,320,000
Contingency 25%	\$ 330,000
Eng/ Survey/ CCA Fees 20%	\$ 264,000
Total:	\$ 1,914,000

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Exhibit JH-3

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 6/21/2017
Project: Water CIP Plan	Prepared By: SAW
KHA No.: 064474143	Checked By: TLS

Title: Project 1.3 - Pump Station #1 - Phase 3 Upgrades - 1 MG GST & (4) - 1,700 gpm pumps	Sheet: 4 of 26
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 66,000	\$ 66,000
2	1 0 MG Ground Storage Tank	1	LS	\$ 1,100,000	\$ 1,100,000
3	1,700 gpm pump	4	EA	\$ 16,000	\$ 64,000
4	Excavation & Backfill	1	LS	\$ 85,000	\$ 85,000
5	Mixer	1	LS	\$ 8,000	\$ 8,000
6	Electrical & SCADA	1	LS	\$ 50,000	\$ 50,000
Basis for Cost Projection:				Subtotal	\$ 1,373,000
<input checked="" type="checkbox"/>	No Design Completed			Contingency	25% \$ 344,000
<input type="checkbox"/>	Preliminary Design			Eng/ Survey/ CCA Fees	20% \$ 275,000
<input type="checkbox"/>	Final Design			Total:	\$ 1,992,000

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Exhibit JH-3

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 6/21/2017
Project: Water CIP Plan	Prepared By: SAW
KHA No.: 064474143	Checked By: TLS

Title: Project 2 - CR 586 12-inch Water Line	Sheet: 5 of 26
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 45,000	\$ 45,000
2	12" Water Line	6,900	LF	\$ 110	\$ 759,000
3	12" Gate Valve (1 per 2,000 LF of pipe)	3	EA	\$ 6,000	\$ 18,000
4	Trench Safety	6,900	LF	\$ 2	\$ 13,800
5	Seed, Fertilizer, and Erosion Control	6,900	LF	\$ 5	\$ 34,500
6	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	7	EA	\$ 7,000	\$ 49,000
7	Connect to Existing Water Line	4	EA	\$ 5,000	\$ 20,000
Basis for Cost Projection:				Subtotal	\$ 940,000
<input checked="" type="checkbox"/>	No Design Completed			Contingency	25% \$ 235,000
<input type="checkbox"/>	Preliminary Design			Eng/ Survey/ CCA Fees	20% \$ 188,000
<input type="checkbox"/>	Final Design			Total:	\$ 1,363,000

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Exhibit JH-3

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client:	Bear Creek SUD	Date:	6/21/2017
Project:	Water CIP Plan	Prepared By:	SAW
KHA No.:	064474143	Checked By:	TLS

Title:	Project 3 - CR 483, CR 484, and CR 535 12" Water Line	Sheet:	6 of 26
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 117,000	\$ 117,000
2	12" Water Line	18,190	LF	\$ 110	\$ 2,000,900
3	12" Gate Valve (1 per 2,000 LF of pipe)	9	EA	\$ 6,000	\$ 54,000
4	Trench Safety	18,190	LF	\$ 2	\$ 36,380
5	Seed, Fertilizer, and Erosion Control	18,190	LF	\$ 5	\$ 90,950
6	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	18	EA	\$ 7,000	\$ 126,000
7	Connect to Existing Water Line	6	EA	\$ 5,000	\$ 30,000
Basis for Cost Projection:				Subtotal	\$ 2,456,000
<input checked="" type="checkbox"/>	No Design Completed			Contingency	25% \$ 614,000
<input type="checkbox"/>	Preliminary Design			Eng/ Survey/ CCA Fees	20% \$ 492,000
<input type="checkbox"/>	Final Design			Total:	\$ 3,562,000

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Exhibit JH-3

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client:	Bear Creek SUD	Date:	6/21/2017
Project:	Water CIP Plan	Prepared By:	SAW
KHA No.:	064474143	Checked By:	TLS

Title:	Project 4 - FM 2755 12" Water Line	Sheet:	7 of 26
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 66,000	\$ 66,000
2	12" Water Line	10,200	LF	\$ 110	\$ 1,122,000
3	12" Gate Valve (1 per 2,000 LF of pipe)	5	EA	\$ 6,000	\$ 30,000
4	Trench Safety	10,200	LF	\$ 2	\$ 20,400
5	Seed, Fertilizer, and Erosion Control	10,200	LF	\$ 5	\$ 51,000
6	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	10	EA	\$ 7,000	\$ 70,000
7	Connect to Existing Water Line	4	EA	\$ 5,000	\$ 20,000
Basis for Cost Projection:				Subtotal	\$ 1,380,000
<input checked="" type="checkbox"/>	No Design Completed			Contingency	25% \$ 345,000
<input type="checkbox"/>	Preliminary Design			Eng/ Survey/ CCA Fees	20% \$ 276,000
<input type="checkbox"/>	Final Design			Total:	\$ 2,001,000

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Exhibit JH-3

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 6/21/2017
Project: Water CIP Plan	Prepared By: SAW
KHA No.: 064474143	Checked By: TLS

Title: Project 5 - CR 541 8" Water Line	Sheet: 8 of 26
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 13,000	\$ 13,000
2	8" Water Line	2,025	LF	\$ 90	\$ 182,250
3	8" Gate Valve	2	EA	\$ 5,000	\$ 10,000
4	Trench Safety	2,025	LF	\$ 2	\$ 4,050
5	Seed, Fertilizer, and Erosion Control	2,025	LF	\$ 5	\$ 10,125
6	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	2	EA	\$ 7,000	\$ 14,000
7	Connect to Existing Water Line	4	EA	\$ 5,000	\$ 20,000
Basis for Cost Projection:					
<input type="checkbox"/>	No Design Completed	Subtotal			\$ 254,000
<input type="checkbox"/>	Preliminary Design	Contingency			25% \$ 64,000
<input type="checkbox"/>		Eng/ Survey/ CCA Fees			20% \$ 51,000
<input type="checkbox"/>	Final Design	Total:			\$ 369,000

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Exhibit JH-3

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 6/21/2017
Project: Water CIP Plan	Prepared By: SAW
KHA No.: 064474143	Checked By: TLS

Title: Project 6 - PR 5400 8" Water Line	Sheet: 9 of 26
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 39,000	\$ 39,000
2	8" Water Line	7,100	LF	\$ 90	\$ 639,000
3	8" Gate Valve	4	EA	\$ 5,000	\$ 20,000
4	Trench Safety	7,100	LF	\$ 2	\$ 14,200
5	Seed, Fertilizer, and Erosion Control	7,100	LF	\$ 5	\$ 35,500
6	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	7	EA	\$ 7,000	\$ 49,000
7	Connect to Existing Water Line	2	EA	\$ 5,000	\$ 10,000
Basis for Cost Projection:				Subtotal	\$ 807,000
<input checked="" type="checkbox"/>	No Design Completed			Contingency	25% \$ 202,000
<input type="checkbox"/>	Preliminary Design			Eng/ Survey/ CCA Fees	20% \$ 162,000
<input type="checkbox"/>	Final Design			Total:	\$ 1,171,000

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Exhibit JH-3

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 6/21/2017
Project: Water CIP Plan	Prepared By: SAW
KHA No.: 064474143	Checked By: TLS

Title: Project 7 - CR 486 12" Water Line	Sheet: 10 of 26
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 59,000	\$ 59,000
2	12" Water Line	9,000	LF	\$ 110	\$ 990,000
3	12" Gate Valve (1 per 2,000 LF of pipe)	5	EA	\$ 6,000	\$ 30,000
4	Trench Safety	9,000	LF	\$ 2	\$ 18,000
5	Seed, Fertilizer, and Erosion Control	9,000	LF	\$ 5	\$ 45,000
6	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	9	EA	\$ 7,000	\$ 63,000
7	Connect to Existing Water Line	4	EA	\$ 5,000	\$ 20,000
Basis for Cost Projection:			Subtotal		\$ 1,225,000
<input checked="" type="checkbox"/>	No Design Completed	Contingency		25%	\$ 307,000
<input type="checkbox"/>	Preliminary Design	Eng/ Survey/ CCA Fees		20%	\$ 245,000
<input type="checkbox"/>	Final Design	Total:			\$ 1,777,000

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Exhibit JH-3

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client:	Bear Creek SUD	Date:	6/21/2017
Project:	Water CIP Plan	Prepared By:	SAW
KHA No.:	064474143	Checked By:	TLS

Title:	Project 8 - Prairie View Lane - 1.0 MG Elevated Storage Tank	Sheet:	11 of 26
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 108,000	\$ 108,000
2	1.0 MG Elevated Storage Tank	1	LS	\$ 2,000,000	\$ 2,000,000
3	Site Work & Yard Piping	1	LS	\$ 100,000	\$ 100,000
4	Electrical / SCADA	1	LS	\$ 50,000	\$ 50,000

Basis for Cost Projection:

- ☒ No Design Completed
☐ Preliminary Design
☐ Final Design

Subtotal		\$ 2,258,000
Contingency	25%	\$ 565,000
Eng/ Survey/ CCA Fees	20%	\$ 452,000
Total:		\$ 3,275,000

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Exhibit JH-3

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 6/21/2017
Project: Water CIP Plan	Prepared By: SAW
KHA No.: 064474143	Checked By: TLS

Title: Project 9 - Prairie View Lane 8" Water Line	Sheet: 12 of 26
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 47,000	\$ 47,000
2	8" Water Line	8,532	LF	\$ 90	\$ 767,880
3	8" Gate Valve	8	EA	\$ 5,000	\$ 40,000
4	Trench Safety	8,532	LF	\$ 2	\$ 17,064
5	Seed, Fertilizer, and Erosion Control	8,532	LF	\$ 5	\$ 42,660
6	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	8	EA	\$ 7,000	\$ 56,000
7	Connect to Existing Water Line	2	EA	\$ 5,000	\$ 10,000
Basis for Cost Projection:				Subtotal	\$ 981,000
<input checked="" type="checkbox"/>	No Design Completed			Contingency	25% \$ 246,000
<input type="checkbox"/>	Preliminary Design			Eng/ Survey/ CCA Fees	20% \$ 197,000
<input type="checkbox"/>	Final Design			Total:	\$ 1,424,000

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Exhibit JH-3

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 6/21/2017
Project: Water CIP Plan	Prepared By: SAW
KHA No.: 064474143	Checked By: TLS

Title: Project 10 - Northstar Road 8" Water Line	Sheet: 13 of 26
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 57,000	\$ 57,000
2	8" Water Line	10,465	LF	\$ 90	\$ 941,850
3	8" Gate Valve	8	EA	\$ 5,000	\$ 40,000
4	Trench Safety	10,465	LF	\$ 2	\$ 20,930
5	Seed, Fertilizer, and Erosion Control	10,465	LF	\$ 5	\$ 52,325
6	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	10	EA	\$ 7,000	\$ 70,000
7	Connect to Existing Water Line	2	EA	\$ 5,000	\$ 10,000
Basis for Cost Projection:				Subtotal	\$ 1,193,000
<input checked="" type="checkbox"/>	No Design Completed			Contingency	25% \$ 299,000
<input type="checkbox"/>	Preliminary Design			Eng/ Survey/ CCA Fees	20% \$ 239,000
<input type="checkbox"/>	Final Design			Total:	\$ 1,731,000

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable construction costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Exhibit JH-3

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 6/21/2017
Project: Water CIP Plan	Prepared By: SAW
KHA No.: 064474143	Checked By: TLS

Title: Project 11 - Prince Lane 8" Water Line	Sheet: 14 of 26
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 44,000	\$ 44,000
2	8" Water Line	8,027	LF	\$ 90	\$ 722,430
3	8" Gate Valve	6	EA	\$ 5,000	\$ 30,000
4	Trench Safety	8,027	LF	\$ 2	\$ 16,054
5	Seed, Fertilizer, and Erosion Control	8,027	LF	\$ 5	\$ 40,135
6	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	8	EA	\$ 7,000	\$ 56,000
7	Connect to Existing Water Line	3	EA	\$ 5,000	\$ 15,000
Basis for Cost Projection:			Subtotal		\$ 924,000
<input checked="" type="checkbox"/>	No Design Completed	Contingency		25%	\$ 231,000
<input type="checkbox"/>	Preliminary Design	Eng/ Survey/ CCA Fees		20%	\$ 185,000
<input type="checkbox"/>	Final Design	Total:			\$ 1,340,000

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable construction costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Exhibit JH-3

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 6/21/2017
Project: Water CIP Plan	Prepared By: SAW
KHA No.: 064474143	Checked By: TLS

Title: Project 12 - CR 483 12" & 8" Water Line	Sheet: 15 of 26
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 92,000	\$ 92,000
2	8" Water Line	3,175	LF	\$ 90	\$ 285,750
3	12" Water Line	11,900	LF	\$ 110	\$ 1,309,000
4	8" Gate Valve	2	LF	\$ 5,000	\$ 10,000
5	12" Gate Valve (1 per 2,000 LF of pipe)	6	EA	\$ 6,000	\$ 36,000
6	Trench Safety	11,900	LF	\$ 2	\$ 23,800
7	Seed, Fertilizer, and Erosion Control	11,900	LF	\$ 5	\$ 59,500
8	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	9	EA	\$ 7,000	\$ 63,000
9	Connect to Existing Water Line	7	EA	\$ 5,000	\$ 35,000
Basis for Cost Projection:				Subtotal	\$ 1,915,000
<input type="checkbox"/>	No Design Completed			Contingency	25% \$ 479,000
<input type="checkbox"/>	Preliminary Design			Eng/ Survey/ CCA Fees	20% \$ 383,000
<input type="checkbox"/>	Final Design			Total:	\$ 2,777,000

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable construction costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Exhibit JH-3

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 6/21/2017
Project: Water CIP Plan	Prepared By: SAW
KHA No.: 064474143	Checked By: TLS

Title: Project 13 - FM 2755 12" Water Line	Sheet: 16 of 26
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 24,000	\$ 24,000
2	12" Water Line	3,640	LF	\$ 110	\$ 400,400
3	12" Gate Valve (1 per 2,000 LF of pipe)	2	EA	\$ 6,000	\$ 12,000
4	Trench Safety	3,640	LF	\$ 2	\$ 7,280
5	Seed, Fertilizer, and Erosion Control	3,640	LF	\$ 5	\$ 18,200
6	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	3	EA	\$ 7,000	\$ 21,000
7	Connect to Existing Water Line	3	EA	\$ 5,000	\$ 15,000
Basis for Cost Projection:				Subtotal	\$ 498,000
<input checked="" type="checkbox"/>	No Design Completed			Contingency	25% \$ 125,000
<input type="checkbox"/>	Preliminary Design			Eng/ Survey/ CCA Fees	20% \$ 100,000
<input type="checkbox"/>	Final Design			Total:	\$ 723,000

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable construction costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Exhibit JH-3

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 6/21/2017
Project: Water CIP Plan	Prepared By: SAW
KHA No.: 064474143	Checked By: TLS

Title: Project 14 - CR 541 12" Water Line	Sheet: 17 of 26
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 30,000	\$ 30,000
2	12" Water Line	4,540	LF	\$ 110	\$ 499,400
3	12" Gate Valve (1 per 2,000 LF of pipe)	2	EA	\$ 6,000	\$ 12,000
4	Trench Safety	4,540	LF	\$ 2	\$ 9,080
5	Seed, Fertilizer, and Erosion Control	4,540	LF	\$ 5	\$ 22,700
6	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	3	EA	\$ 7,000	\$ 21,000
7	Connect to Existing Water Line	4	EA	\$ 5,000	\$ 20,000
Basis for Cost Projection: <input checked="" type="checkbox"/> No Design Completed <input type="checkbox"/> Preliminary Design <input type="checkbox"/> Final Design					Subtotal \$ 615,000 Contingency 25% \$ 154,000 Eng/ Survey/ CCA Fees 20% \$ 123,000 Total: \$ 892,000

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable construction costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Exhibit JH-3

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 6/21/2017
Project: Water CIP Plan	Prepared By: SAW
KHA No.: 064474143	Checked By: TLS

Title: Project 15 - CR 587 12" Water Line	Sheet: 18 of 26
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 62,000	\$ 62,000
2	12" Water Line	9,620	LF	\$ 110	\$ 1,058,200
3	12" Gate Valve (1 per 2,000 LF of pipe)	5	EA	\$ 6,000	\$ 30,000
4	Trench Safety	9,620	LF	\$ 2	\$ 19,240
5	Seed, Fertilizer, and Erosion Control	9,620	LF	\$ 5	\$ 48,100
6	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	9	EA	\$ 7,000	\$ 63,000
7	Connect to Existing Water Line	2	EA	\$ 5,000	\$ 10,000
Basis for Cost Projection:			Subtotal		\$ 1,291,000
<input checked="" type="checkbox"/>	No Design Completed	Contingency		25%	\$ 323,000
<input type="checkbox"/>	Preliminary Design	Eng/ Survey/ CCA Fees		20%	\$ 259,000
<input type="checkbox"/>	Final Design	Total:			\$ 1,873,000

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable construction costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Exhibit JH-3

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 6/21/2017
Project: Water CIP Plan	Prepared By: SAW
KHA No.: 064474143	Checked By: TLS

Title: Project 16.1 - Pump Station #2 - Pressure Plane #1 Upgrades	Sheet: 19 of 26
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 65,000	\$ 65,000
2	1 0 MG Ground Storage Tank	1	LS	\$ 1,100,000	\$ 1,100,000
3	1200 gpm pump	4	EA	\$ 14,000	\$ 56,000
4	Excavation & Backfill	1	LS	\$ 85,000	\$ 85,000
5	Mixer	1	LS	\$ 8,000	\$ 8,000
6	Electrical & SCADA	1	LS	\$ 50,000	\$ 50,000

Basis for Cost Projection:

- ☒ No Design Completed
☐ Preliminary Design
☐ Final Design

Subtotal	\$ 1,364,000
Contingency 25%	\$ 341,000
Eng/ Survey/ CCA Fees 20%	\$ 273,000
Total:	\$ 1,978,000

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Exhibit JH-3

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 6/21/2017
Project: Water CIP Plan	Prepared By: SAW
KHA No.: 064474143	Checked By: TLS

Title: Project 16.2 - Pump Station #2 - Pressure Plane #2 Upgrades	Sheet: 20 of 26
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 218,000	\$ 218,000
2	2.0 MG Ground Storage Tank	2	EA	\$ 2,000,000	\$ 4,000,000
3	2,200 gpm pump	4	EA	\$ 30,000	\$ 120,000
4	Excavation & Backfill	1	LS	\$ 160,000	\$ 160,000
5	Mixer	2	EA	\$ 8,000	\$ 16,000
6	Electrical & SCADA	1	LS	\$ 50,000	\$ 50,000

Basis for Cost Projection:

- ☒ No Design Completed
☐ Preliminary Design
☐ Final Design

Subtotal		\$ 4,564,000
Contingency	25%	\$ 1,141,000
Eng/ Survey/ CCA Fees	20%	\$ 913,000
Total:		\$ 6,618,000

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Exhibit JH-3

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 6/21/2017
Project: Water CIP Plan	Prepared By: SAW
KHA No.: 064474143	Checked By: TLS

Title: Project 17 - King Road 20-inch Water Line	Sheet: 21 of 26
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 90,000	\$ 90,000
2	20" Water Line	8,590	LF	\$ 190	\$ 1,632,100
3	20" Butterfly Valve (1 per 2,000 LF of pipe)	4	EA	\$ 9,000	\$ 36,000
4	Trench Safety	8,590	LF	\$ 2	\$ 17,180
5	Seed, Fertilizer, and Erosion Control	8,590	LF	\$ 5	\$ 42,950
6	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	8	EA	\$ 7,000	\$ 56,000
7	Connect to Existing Water Line	3	EA	\$ 5,000	\$ 15,000
Basis for Cost Projection:				Subtotal	\$ 1,890,000
<input checked="" type="checkbox"/>	No Design Completed			Contingency	25% \$ 473,000
<input type="checkbox"/>	Preliminary Design			Eng/ Survey/ CCA Fees	20% \$ 378,000
<input type="checkbox"/>	Final Design			Total:	\$ 2,741,000

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable construction costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Exhibit JH-3

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client:	Bear Creek SUD	Date:	6/21/2017
Project:	Water CIP Plan	Prepared By:	SAW
KHA No.:	064474143	Checked By:	TLS

Title:	Project 18 - Pump Station #2 - Pressure Plane #1 - 16-inch and 12-inch Water Line	Sheet:	22 of 26
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 34,000	\$ 34,000
2	16" Water Line	2,200	LF	\$ 160	\$ 352,000
3	16" Butterfly Valve (1 per 2,000 LF of pipe)	2	EA	\$ 8,000	\$ 16,000
4	Bore with 30" Steel Casing	115	LF	\$ 900	\$ 103,500
5	12" Water Line	1,100	LF	\$ 110	\$ 121,000
6	12" Gate Valve	2	EA	\$ 6,000	\$ 12,000
7	Trench Safety	3,300	LF	\$ 2	\$ 6,600
8	Seed, Fertilizer, and Erosion Control	2,200	LF	\$ 5	\$ 11,000
9	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	4	EA	\$ 7,000	\$ 28,000
10	Connect to Existing Water Line	4	EA	\$ 5,000	\$ 20,000

Basis for Cost Projection:

- ☒ No Design Completed
☐ Preliminary Design
☒ Final Design

Subtotal	\$ 705,000
Contingency	25% \$ 177,000
Eng/ Survey/ CCA Fees	20% \$ 141,000
Total:	\$ 1,023,000

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable construction costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Exhibit JH-3

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 6/21/2017
Project: Water CIP Plan	Prepared By: SAW
KHA No.: 064474143	Checked By: TLS

Title: Project 19 - CR 486 12" Water Line	Sheet: 23 of 26
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost	
1	Mobilization, Bonds, and Insurance	1	LS	\$ 29,000	\$ 29,000	
2	12" Water Line	4,430	LF	\$ 110	\$ 487,300	
3	12" Gate Valve (1 per 2,000 LF of pipe)	2	EA	\$ 6,000	\$ 12,000	
4	Trench Safety	4,430	LF	\$ 2	\$ 8,860	
5	Seed, Fertilizer, and Erosion Control	4,430	LF	\$ 5	\$ 22,150	
6	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	4	EA	\$ 7,000	\$ 28,000	
7	Connect to Existing Water Line	3	EA	\$ 5,000	\$ 15,000	
Basis for Cost Projection:			Subtotal	\$ 603,000		
<input checked="" type="checkbox"/>	No Design Completed	Contingency			25%	\$ 151,000
<input type="checkbox"/>	Preliminary Design	Eng/ Survey/ CCA Fees			20%	\$ 121,000
<input type="checkbox"/>	Final Design	Total:			\$ 875,000	

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Exhibit JH-3

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 6/21/2017
Project: Water CIP Plan	Prepared By: SAW
KHA No.: 064474143	Checked By: TLS

Title: Project 20 - CR 484 1.5 MG Elevated Storage Tank	Sheet: 24 of 26
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 163,000	\$ 163,000
2	1 5 MG Elevated Storage Tank	1	LS	\$ 3,000,000	\$ 3,000,000
3	Site Work & Yard Piping	1	LS	\$ 100,000	\$ 100,000
4	Demolish and Depose of Existing 300,000 gallon EST	1	LS	\$ 100,000	\$ 100,000
5	Electrical / SCADA	1	LS	\$ 50,000	\$ 50,000

- Basis for Cost Projection:**
- ☒ No Design Completed
 - ☐ Preliminary Design
 - ☐ Final Design

Subtotal	\$ 3,413,000
Contingency 25%	\$ 854,000
Eng/ Survey/ CCA Fees 20%	\$ 683,000
Total:	\$ 4,950,000

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Exhibit JH-3

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 6/21/2017
Project: Water CIP Plan	Prepared By: SAW
KHA No.: 064474143	Checked By: TLS

Title: Project 21 - FM 2755 12"Water Line	Sheet: 25 of 26
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 53,000	\$ 53,000
2	12" Water Line	8,090	LF	\$ 110	\$ 889,900
3	12" Gate Valve (1 per 2,000 LF of pipe)	4	EA	\$ 6,000	\$ 24,000
4	Trench Safety	8,090	LF	\$ 2	\$ 16,180
5	Seed, Fertilizer, and Erosion Control	8,090	LF	\$ 5	\$ 40,450
6	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	8	EA	\$ 7,000	\$ 56,000
7	Connect to Existing Water Line	3	EA	\$ 5,000	\$ 15,000
Basis for Cost Projection:			Subtotal		\$ 1,095,000
<input type="checkbox"/>	No Design Completed	Contingency		25%	\$ 274,000
<input type="checkbox"/>	Preliminary Design	Eng/ Survey/ CCA Fees		20%	\$ 219,000
<input type="checkbox"/>	Final Design	Total:			\$ 1,588,000

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Exhibit JH-3

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 6/21/2017
Project: Water CIP Plan	Prepared By: SAW
KHA No.: 064474143	Checked By: TLS

Title: Project 22 - HWY 78 12" Water Line	Sheet: 26 of 26
---	-----------------

Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 49,000	\$ 49,000
2	12" Water Line	7,400	LF	\$ 110	\$ 814,000
3	12" Gate Valve (1 per 2,000 LF of pipe)	4	EA	\$ 6,000	\$ 24,000
4	Trench Safety	7,400	LF	\$ 2	\$ 14,800
5	Seed, Fertilizer, and Erosion Control	7,400	LF	\$ 5	\$ 37,000
6	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	8	EA	\$ 7,000	\$ 56,000
7	Connect to Existing Water Line	3	EA	\$ 5,000	\$ 15,000

Basis for Cost Projection:

- ☒ No Design Completed
☐ Preliminary Design
☐ Final Design

Subtotal	\$ 1,010,000
Contingency 25%	\$ 253,000
Eng/ Survey/ CCA Fees 20%	\$ 202,000
Total:	\$ 1,465,000

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Exhibit JH-4

Kimley»Horn

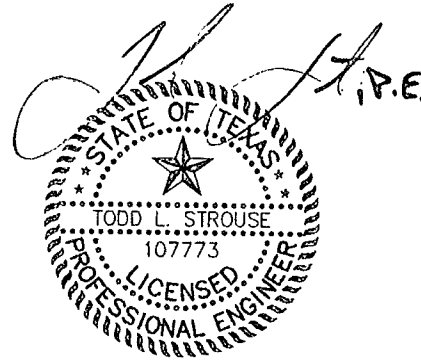
TECHNICAL MEMORANDUM

To: Camille Reagan
Bear Creek Special Utility District

From: Todd Strouse, P.E.
Kimley-Horn and Associates, Inc.

Date: October 12, 2018

Subject: Water Master Plan Update – Bear Creek Special Utility District



10/12/2018

SUMMARY

Bear Creek Special Utility District (BCSUD) requested that Kimley-Horn evaluate their existing water system and develop a buildout Water Master Plan that included a project list and associated costs for the various projects included. In June of 2017, the original plan was developed. This Technical Memorandum is provided as an update to the June 2017 document

For the purposes of this Water Master Plan, a new development density of 5 lots per acre on 80% of each available tract was used to determine the future number of connections in each of BCSUD's three existing pressure planes. Table 1 shows the existing and future numbers of connections that are projected for each pressure plane

Table 1 – Existing and Proposed Connections

Pressure Plane	Connections (Dec 31 st , 2017)	Additional Connections to Buildout*	Total Buildout Connections
1	699	2,630	3,329
2	1,076	8,522	9,598
3	434	6,866	7,300
Total	2,209	18,018	20,227

*Please note that a specific year for buildout is not known

The existing system was modeled using Bentley Water CAD software in order to determine the necessary improvements needed to support the buildout growth expected. The projects identified will allow BCSUD to meet buildout system-wide peak hour flows, and will allow all future developments to provide 1,500 gallons per minute (gpm) fire flow for a two-hour duration. A total of twenty-three (23) projects have been identified that will be necessary to meet buildout demands at a total cost to construct of \$56,254,000, including survey and engineering

Exhibit JH-4

Kimley»Horn

Page 2

DESIGN CRITERIA

Demand Allocation

Utilizing historical data provided by BCSUD and the current Alternative Capacity Requirement (ACR) approved by TCEQ, the average day demand for current customers is approximately 0.23 gpm / connection (0.56 gpm/connection for max day demand approved by TCEQ on August 24, 2015). Assuming 3 persons per connection, this equates to 110 gallons per capita per day (gpcd). Pumping records and elevated storage tank (EST) level records were not available, therefore, a peak hour to max day ratio of 1.25 was used in accordance with TCEQ chapter 290.

Existing tracts of land located inside the water CCN with no current water meter and some large tracts that currently have a water meter were identified as future developable tracts. Each tract is shown on the Master Plan exhibit located in Appendix 1 with a total acreage and a total percent of future demand for its respective pressure plane. The total number of connections assumed on each tract of land was assumed to be 80% of all land located outside of the current FEMA 100-year floodplain as shown graphically on an individual tract multiplied by a density of five units per acre.

Water Transmission Pipe Sizing

Pipes were sized in the distribution system to meet maximum day demands as well as to meet fire flow requirements. Pipe sizes were selected to limit velocities to a maximum of 8 ft/sec under maximum day demand scenarios and to meet minimum TCEQ pressure requirements.

Pumping Capacity

Pumping capacity for each pressure plane was evaluated to determine the pumps that will be necessary to meet peak hour or fire flow demands during a maximum day demand scenario. In each pressure plane, maximum day plus fire flow of 1,500 gallons per minute was greater than the peak hour of the maximum day as defined by TCEQ. Therefore, the maximum day plus fire flow scenario was the design flow for each pump station.

TCEQ chapter 290 requirements dictate that the pump station must be able to meet peak hour demands with the largest pump out of service. Future pump selections are based on meeting this requirement, as well as fire flow requirements. Table 2 summarizes the pump selections required for each pressure plane.

Table 2 – Buildout Pump Selections by Pressure Plane

Pressure Plane	Pump Selection	Pump Station #
1	4 – 1,200 gpm pumps	2
2	4 – 2,200 gpm pumps	2
3	4 – 1,700 gpm pumps	1

Exhibit JH-4

Kimley»Horn

Page 3

Ground Storage Tanks

Ground storage for each pressure plane at buildout was evaluated as part of this project. TCEQ Chapter 290 regulations give total storage requirements of 200 gallons per connection, but do not specify the percentage of this storage that must be ground storage. For the purposes of this study, Kimley-Horn recommends that 50% of maximum daily demand should be available as ground storage. The buildout ground storage identified in Table 3 will provide approximately 50% of the maximum daily demand for the respective pressure plane.

Table 3 – Proposed Ground Storage Tanks

Pressure Plane	Additional Ground Storage Tanks	Pump Station #
1	(1) – 1.0 MG Tank*	2
2	(2) – 2.0 MG Tanks*	2
3	(2) – 1.0 MG Tanks (1) – 0.5 MG Tank	1

*Additional land may need to be acquired at Pump Station #2 for future pumps and ground storage tanks

Elevated Storage Tank Capacity

TCEQ Chapter 290 requires a minimum of 100 gallons per connection for elevated storage capacity. This criteria was utilized as a baseline to determine the adequacy of the existing elevated storage tanks in the system, however, other factors such as retaining a 2-hour fire-fighting reserve, and the daily tank cycling were also evaluated.

The existing 400,000 gallon elevated storage tank (EST) in Pressure Plane #1 will be adequate to serve through buildout as long as scheduled maintenance is performed and the tank is in good operating condition. Pressure Plane #2 will require an additional 1.5 MG of EST capacity. The location of the proposed tank is shown on the Master Plan exhibit in Appendix 1. It is assumed that the existing 300,000 gallon tank will stay in service when the new tank comes online, and the existing 200,000 gallon tank will be taken out of service and demolished. Pressure Plane #3 will require an additional 1 MG EST. The existing 200,000 gallon tank that serves Pressure Plane #3 currently is expected to stay online through buildout. Table 4 summarizes the elevated storage tanks that are proposed for each Pressure Plane.

Table 4 – Proposed Elevated Storage Tanks

Pressure Plane	Existing Elevated Storage Tanks	Proposed Elevated Storage Tanks
1	(1) – 400,000 gal Tank	N/A
2	(1) – 300,000 gal Tank (1) – 200,000 gal Tank	1,500,000 gal
3	(1) – 200,000 gal Tank	1,000,000 gal

Exhibit JH-4

Kimley»Horn

Page 4

SUMMARY

Future water demands and water infrastructure necessary to meet these demands were evaluated as part of this study. Twenty-three different Master Plan projects have been identified to meet this demand from now until buildout of the water service area. The total cost of all improvements including survey and engineering is estimated to be \$56,254,000. Individual project OPCC's can be found in Appendix 2 of this memo. Appendix 1 shows a map with all projects that have been identified and each future tract of land to be developed assumed future demand contributions.

Thank you for the opportunity to be of service to BCSUD. If you have any questions, please do not hesitate to contact me directly.



Todd Strouse, P.E.

Kimley-Horn & Associates, Inc.
260 East Davis Street, Suite 100
McKinney, Texas 75069
(469) 301-2592

Attachments:

Appendix 1 – Master Plan Project Map

Appendix 2 – Opinions of Probable Construction Costs (OPCC's)

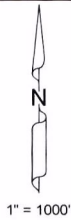
Exhibit JH-4

Kimley»Horn

APPENDIX 1

MASTER PLAN PROJECT MAP

Exhibit JH-4



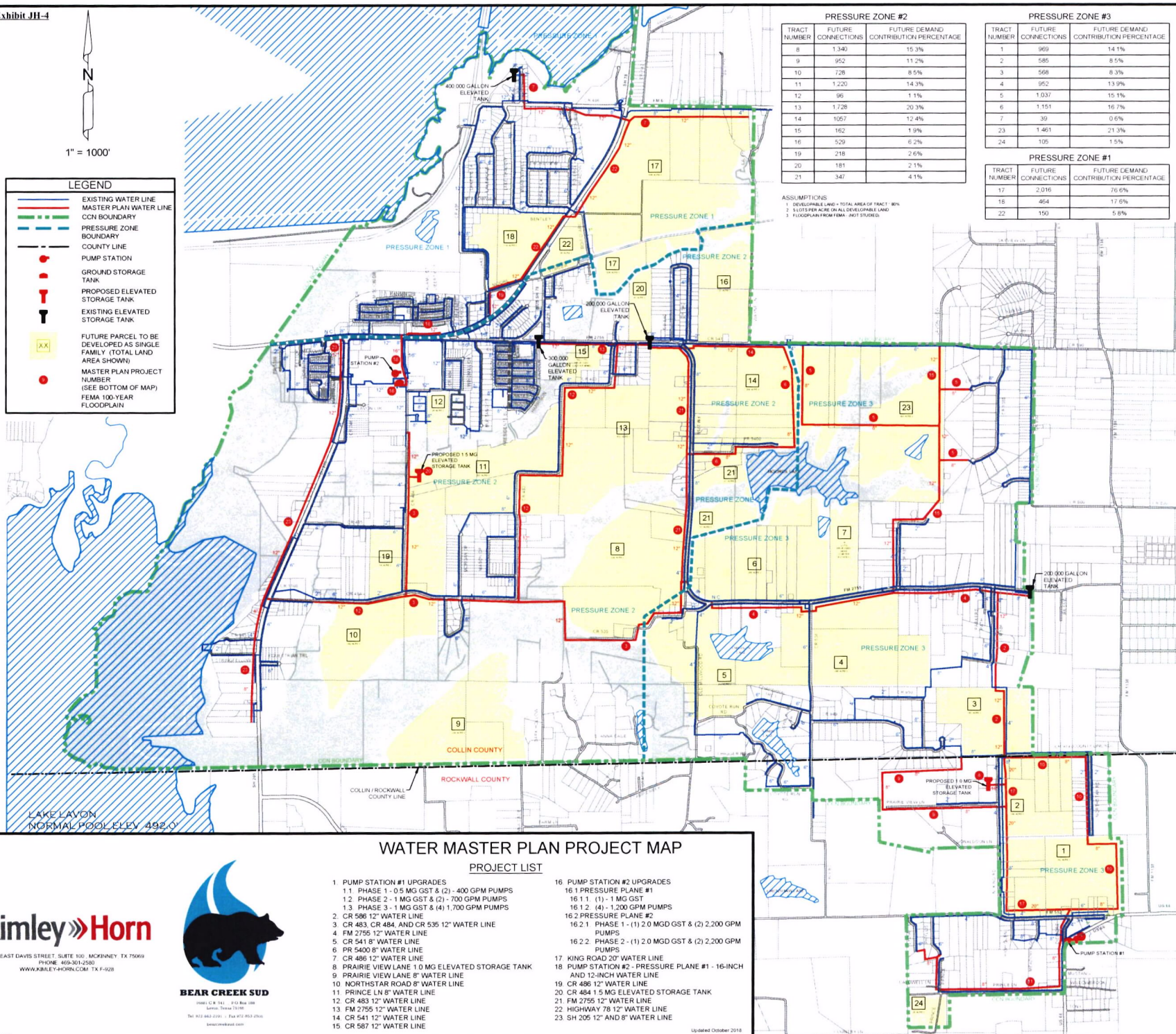
LEGEND	
	EXISTING WATER LINE
	MASTER PLAN WATER LINE
	CCN BOUNDARY
	PRESSURE ZONE BOUNDARY
	COUNTY LINE
	PUMP STATION
	GROUND STORAGE TANK
	PROPOSED ELEVATED STORAGE TANK
	EXISTING ELEVATED STORAGE TANK
	FUTURE PARCEL TO BE DEVELOPED AS SINGLE FAMILY (TOTAL LAND AREA SHOWN)
	MASTER PLAN PROJECT NUMBER (SEE BOTTOM OF MAP)
	FEMA 100-YEAR FLOODPLAIN

PRESSURE ZONE #2		
TRACT NUMBER	FUTURE CONNECTIONS	FUTURE DEMAND CONTRIBUTION PERCENTAGE
8	1,340	15.3%
9	952	11.2%
10	728	8.5%
11	1,220	14.3%
12	96	1.1%
13	1,728	20.3%
14	1067	12.4%
15	162	1.9%
16	529	6.2%
19	218	2.6%
20	181	2.1%
21	347	4.1%

PRESSURE ZONE #3		
TRACT NUMBER	FUTURE CONNECTIONS	FUTURE DEMAND CONTRIBUTION PERCENTAGE
1	969	14.1%
2	585	8.5%
3	568	8.3%
4	952	13.9%
5	1,037	15.1%
6	1,151	16.7%
7	39	0.6%
23	1,461	21.3%
24	105	1.5%

PRESSURE ZONE #1		
TRACT NUMBER	FUTURE CONNECTIONS	FUTURE DEMAND CONTRIBUTION PERCENTAGE
17	2,016	26.6%
18	464	17.6%
22	150	5.8%

ASSUMPTIONS
 1. DEVELOPABLE LAND - TOTAL AREA OF TRACT - 80%
 2. LOTS PER ACRE IN ALL DEVELOPABLE LAND
 3. FLOODPLAIN FROM FEMA - NOT STUDIED



WATER MASTER PLAN PROJECT MAP

PROJECT LIST

- PUMP STATION #1 UPGRADES
 - PHASE 1 - 0.5 MG GST & (2) - 400 GPM PUMPS
 - PHASE 2 - 1 MG GST & (2) - 700 GPM PUMPS
 - PHASE 3 - 1 MG GST & (4) 1,700 GPM PUMPS
- CR 586 12" WATER LINE
- CR 483, CR 484, AND CR 535 12" WATER LINE
- FM 2755 12" WATER LINE
- CR 541 8" WATER LINE
- PR 5400 8" WATER LINE
- CR 486 12" WATER LINE
- PAIRIE VIEW LANE 1.0 MG ELEVATED STORAGE TANK
- PAIRIE VIEW LANE 8" WATER LINE
- NORTHSTAR ROAD 8" WATER LINE
- PRINCE LN 8" WATER LINE
- CR 483 12" WATER LINE
- FM 2755 12" WATER LINE
- CR 541 12" WATER LINE
- CR 587 12" WATER LINE
- PUMP STATION #2 UPGRADES
 - PRESSURE PLANE #1
 - (1) - 1 MG GST
 - (4) - 1,200 GPM PUMPS
 - PRESSURE PLANE #2
 - PHASE 1 - (1) 2.0 MGD GST & (2) 2,000 GPM PUMPS
 - PHASE 2 - (1) 2.0 MGD GST & (2) 2,000 GPM PUMPS
- KING ROAD 20" WATER LINE
- PUMP STATION #2 - PRESSURE PLANE #1 - 16-INCH AND 12-INCH WATER LINE
- CR 486 12" WATER LINE
- CR 484 1.5 MG ELEVATED STORAGE TANK
- FM 2755 12" WATER LINE
- HIGHWAY 78 12" WATER LINE
- SH 205 12" AND 8" WATER LINE

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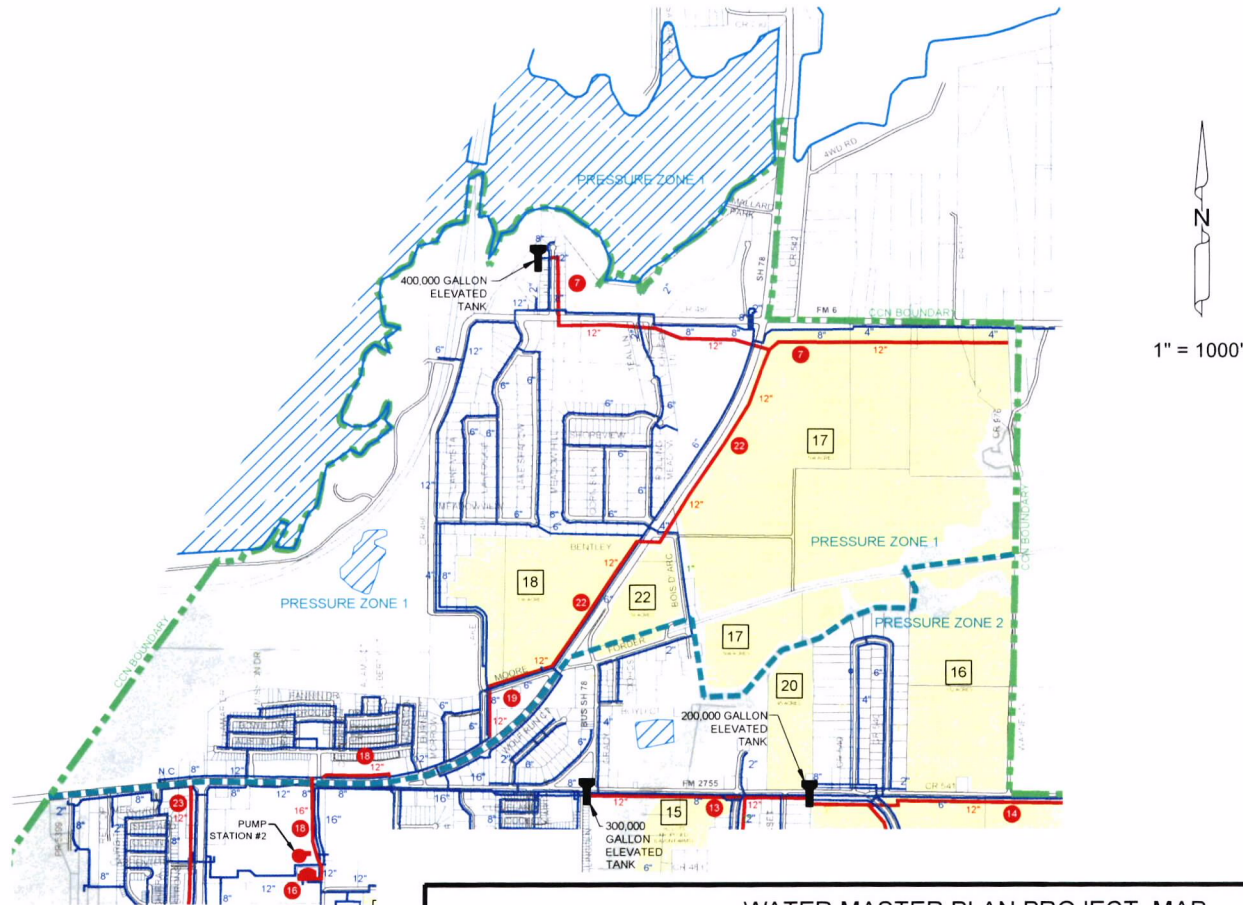
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 WWW.KIMLEY-HORN.COM TX F-028



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 info@kimley-horn.com

Updated October 2018

Exhibit JH-4



LEGEND	
	EXISTING WATER LINE
	MASTER PLAN WATER LINE
	CCN BOUNDARY
	PRESSURE ZONE BOUNDARY
	COUNTY LINE
	PUMP STATION
	GROUND STORAGE TANK
	PROPOSED ELEVATED STORAGE TANK
	EXISTING ELEVATED STORAGE TANK
	FUTURE PARCEL TO BE DEVELOPED AS SINGLE FAMILY (TOTAL LAND AREA SHOWN)
	MASTER PLAN PROJECT NUMBER (SEE BOTTOM OF MAP)
	FEMA 100-YEAR FLOODPLAIN

PRESSURE ZONE #1

TRACT NUMBER	FUTURE CONNECTIONS	FUTURE DEMAND CONTRIBUTION PERCENTAGE
17	2,016	76.6%
18	464	17.6%
22	150	5.8%

ASSUMPTIONS

1. DEVELOPABLE LAND = TOTAL AREA OF TRACT * 80%
2. 5 LOTS PER ACRE ON ALL DEVELOPABLE LAND
3. FLOODPLAIN FROM FEMA - (NOT STUDIED)

WATER MASTER PLAN PROJECT MAP PRESSURE ZONE #1

PROJECT LIST

1. PUMP STATION #1 UPGRADES
 - 1.1. PHASE 1 - 0.5 MG GST & (2) - 400 GPM PUMPS
 - 1.2. PHASE 2 - 1 MG GST & (2) - 700 GPM PUMPS
 - 1.3. PHASE 3 - 1 MG GST & (4) 1,700 GPM PUMPS
2. CR 586 12" WATER LINE
3. CR 483, CR 484, AND CR 535 12" WATER LINE
4. FM 2755 12" WATER LINE
5. CR 541 8" WATER LINE
6. PR 5400 8" WATER LINE
7. CR 486 12" WATER LINE
8. PRAIRIE VIEW LANE 1.0 MG ELEVATED STORAGE TANK
9. PRAIRIE VIEW LANE 8" WATER LINE
10. NORTHSTAR ROAD 8" WATER LINE
11. PRINCE LN 8" WATER LINE
12. CR 483 12" WATER LINE
13. FM 2755 12" WATER LINE
14. CR 541 12" WATER LINE
15. CR 587 12" WATER LINE
16. PUMP STATION #2 UPGRADES
 - 16.1.1. PHASE 1 - 1 MG GST
 - 16.1.2. (4) - 1,200 GPM PUMPS
 - 16.2. PHASE 2 - 1 MG GST
 - 16.2.1. PHASE 1 - (1) 2.0 MGD GST & (2) 2,000 GPM PUMPS
 - 16.2.2. PHASE 2 - (1) 2.0 MGD GST & (2) 2,000 GPM PUMPS
17. KING ROAD 20" WATER LINE
18. PUMP STATION #2 - PRESSURE PLANE
 - 18.1. 16-INCH AND 12-INCH WATER LINE
 - 18.2. 16-INCH AND 12-INCH WATER LINE
19. CR 486 12" WATER LINE
20. CR 484 1.5 MG ELEVATED STORAGE TANK
21. FM 2755 12" WATER LINE
22. HIGHWAY 78 12" WATER LINE
23. SH 205 12" AND 8" WATER LINE



BEAR CREEK SUD

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Exhibit JH-4



BEAR CREEK SUD

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bearsud@bearsud.com

WATER MASTER PLAN PROJECT MAP PRESSURE ZONE #2

PROJECT LIST

1. PUMP STATION #1 UPGRADES
- 1.1. PHASE 1 - 0.5 MG GST & (2) - 400 GPM PUMPS
- 1.2. PHASE 2 - 1 MG GST & (2) - 700 GPM PUMPS
- 1.3. PHASE 3 - 1 MG GST & (4) - 1,700 GPM PUMPS
2. CR 586 12" WATER LINE
3. CR 483, CR 484 AND CR 535 12" WATER LINE
4. FM 2755 12" WATER LINE
5. CR 541 8" WATER LINE
6. PR 5400 8" WATER LINE
7. CR 486 12" WATER LINE
8. PRAIRIE VIEW LANE 1.0 MG ELEVATED STORAGE TANK
9. PRAIRIE VIEW LANE 8" WATER LINE
10. NORTHSTAR ROAD 8" WATER LINE
11. PRINCE LN 8" WATER LINE
12. CR 483 12" WATER LINE
13. FM 2755 12" WATER LINE
14. CR 541 12" WATER LINE
15. CR 587 12" WATER LINE
16. PUMP STATION #2 UPGRADES
- 16.1. PHASE 1 - 1 MG GST
- 16.1.2. (1) - 1,200 GPM PUMPS
- 16.2. PHASE 2 - 1 MG GST
- 16.2.1. PHASE 1 - (1) 2.0 MOD GST & (2) 2,200 GPM PUMPS
- 16.2.2. PHASE 2 - (1) 2.0 MOD GST & (2) 2,200 GPM PUMPS
17. KING ROAD 20" WATER LINE
18. PUMP STATION #2 - PRESSURE PLANE
- 18.1. 16-INCH AND 12-INCH WATER LINE
19. CR 486 12" WATER LINE
20. CR 484 1.5 MG ELEVATED STORAGE TANK
21. FM 2755 12" WATER LINE
22. HIGHWAY 78 12" WATER LINE
23. SH 205 12" AND 8" WATER LINE

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PRESSURE ZONE #2

TRACT NUMBER	FUTURE CONNECTIONS	FUTURE DEMAND CONTRIBUTION PERCENTAGE
8	1,340	15.3%
9	952	11.2%
10	728	8.5%
11	1,220	14.3%
12	96	1.1%
13	1,728	20.3%
14	1057	12.4%
15	162	1.9%
16	529	6.2%
19	218	2.6%
20	181	2.1%
21	347	4.1%

ASSUMPTIONS
1. DEVELOPABLE LAND = TOTAL AREA OF TRACT * 80%
2. 5 LOTS PER ACRE ON ALL DEVELOPABLE LAND
3. FLOODPLAIN FROM FEMA - (NOT STUDIED)

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1" = 1000'

LEGEND

- EXISTING WATER LINE
- MASTER PLAN WATER LINE
- CCN BOUNDARY
- PRESSURE ZONE BOUNDARY
- COUNTY LINE
- PUMP STATION
- GROUND STORAGE TANK
- PROPOSED ELEVATED STORAGE TANK
- EXISTING ELEVATED STORAGE TANK
- FUTURE PARCEL TO BE DEVELOPED AS SINGLE FAMILY (TOTAL LAND AREA SHOWN)
- MASTER PLAN PROJECT NUMBER (SEE BOTTOM OF MAP)
- FEMA 100-YEAR FLOODPLAIN

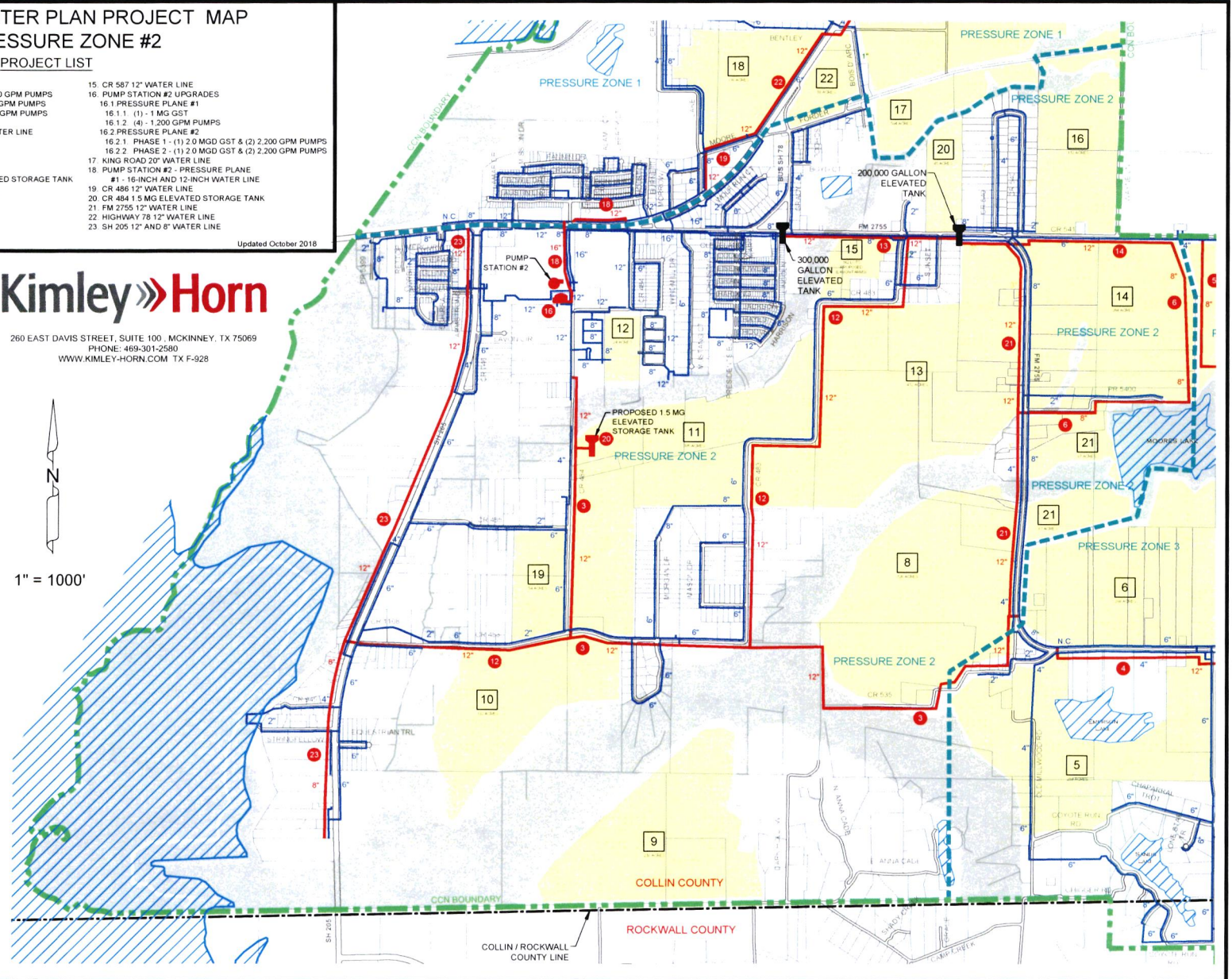
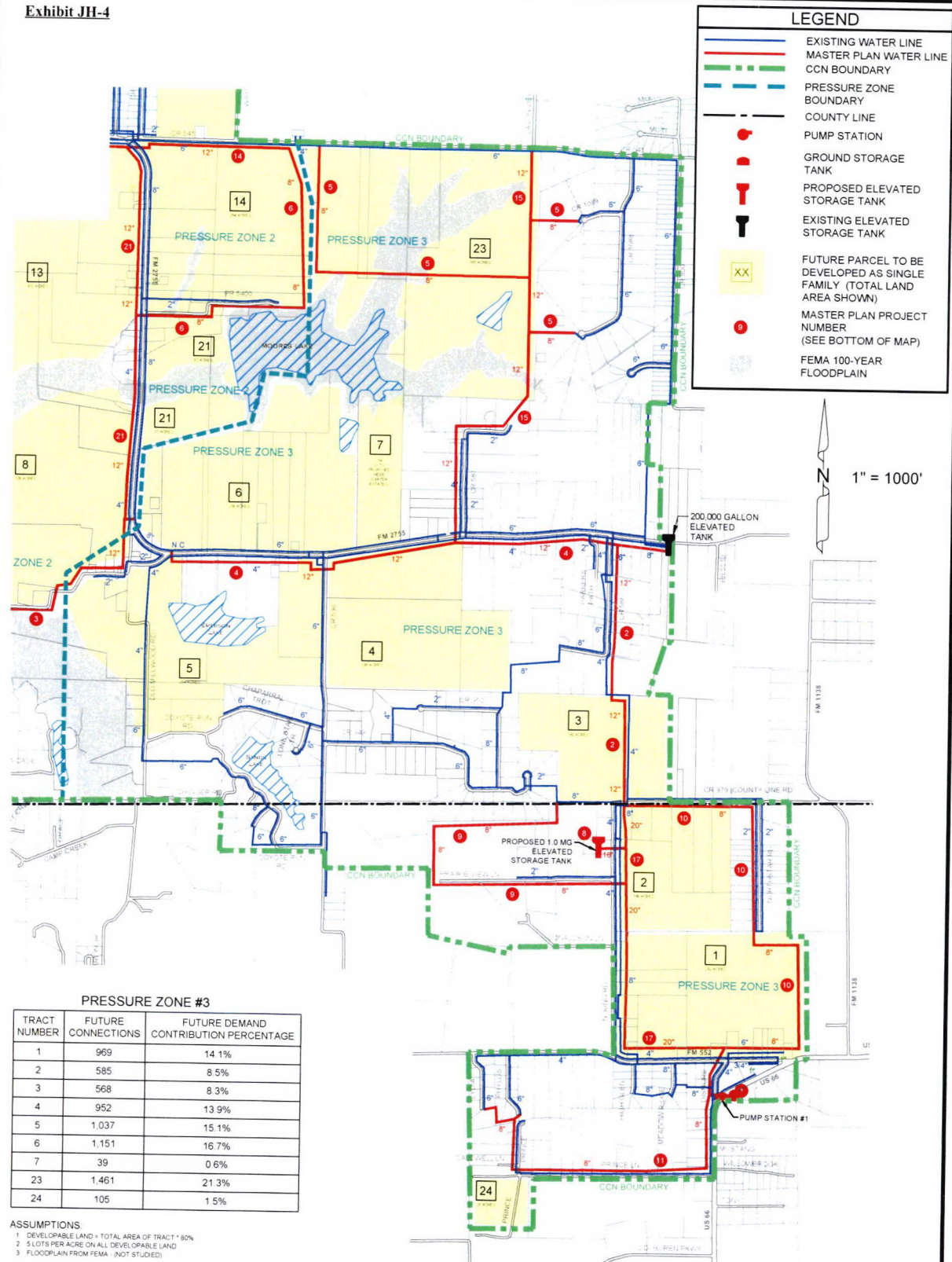


Exhibit JH-4



WATER MASTER PLAN PROJECT MAP PRESSURE ZONE #3

PROJECT LIST

1. PUMP STATION #1 UPGRADES
 - 1.1 PHASE 1 - 0.5 MG GST & (2) - 400 GPM PUMPS
 - 1.2 PHASE 2 - 1 MG GST & (2) - 700 GPM PUMPS
 - 1.3 PHASE 3 - 1 MG GST & (4) 1,700 GPM PUMPS
2. CR 586 12" WATER LINE
3. CR 483, CR 484 AND CR 535 12" WATER LINE
4. FM 2755 12" WATER LINE
5. CR 541 8" WATER LINE
6. PR 5400 8" WATER LINE
7. CR 486 12" WATER LINE
8. PRAIRIE VIEW LANE 1.0 MG ELEVATED STORAGE TANK
9. PRAIRIE VIEW LANE 8" WATER LINE
10. NORTHSTAR ROAD 8" WATER LINE
11. PRINCE LN 8" WATER LINE
12. CR 483 12" WATER LINE
13. FM 2755 12" WATER LINE
14. CR 541 12" WATER LINE
15. CR 587 12" WATER LINE
16. PUMP STATION #2 UPGRADES
 - 16.1 PHASE 1 - 1 MG GST
 - 16.1.2 (4) - 1,200 GPM PUMPS
 - 16.2 PHASE 2 - 2.0 MG GST & (2) 2,200 GPM PUMPS
 - 16.2.1 PHASE 1 - (1) 2.0 MG GST & (2) 2,200 GPM PUMPS
 - 16.2.2 PHASE 2 - (1) 2.0 MG GST & (2) 2,200 GPM PUMPS
17. KING ROAD 20" WATER LINE
18. PUMP STATION #2 - PRESSURE PLANE
 - 18.1 16-INCH AND 12-INCH WATER LINE
19. CR 486 12" WATER LINE
20. CR 484 1.5 MG ELEVATED STORAGE TANK
21. FM 2755 12" WATER LINE
22. HIGHWAY 78 12" WATER LINE
23. SH 205 12" AND 8" WATER LINE



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Exhibit JH-4

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APPENDIX 2

OPINIONS OF PROBABLE CONSTRUCTION COSTS (OPCC'S)

Exhibit JH-4

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 8/13/2018
Project: Water Master Plan	Prepared By: SAW
KHA No.: 064474160	Checked By: TLS

Title: Water Master Plan Project Summary	Sheet: 1 of 28
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Project	Item Cost
Project 1.1 - Pump Station #1 - Phase 1 Upgrades - 0.5 MG GST & (2) - 400 gpm pumps	\$ 2,671,000
Project 1.2 - Pump Station #1 - Phase 2 Upgrades - 1 MG GST & (2) - 700 gpm pumps	\$ 1,914,000
Project 1.3 - Pump Station #1 - Phase 3 Upgrades - 1 MG GST & (4) - 1,700 gpm pumps	\$ 1,992,000
Project 2 - CR 586 12-inch Water Line	\$ 1,363,000
Project 3 - CR 483, CR 484, and CR 535 12" Water Line	\$ 3,562,000
Project 4 - FM 2755 12" Water Line	\$ 2,001,000
Project 5 - CR 541 8" Water Line	\$ 369,000
Project 6 - PR 5400 8" Water Line	\$ 1,171,000
Project 7 - CR 486 12" Water Line	\$ 1,777,000
Project 8 - Prairie View Lane - 1.0 MG Elevated Storage Tank	\$ 3,275,000
Project 9 - Prairie View Lane 8" Water Line	\$ 1,424,000
Project 10 - Northstar Road 8" Water Line	\$ 1,731,000
Project 11 - Prince Lane 8" Water Line	\$ 1,340,000
Project 12 - CR 483 12" Water Line	\$ 3,298,000
Project 13 - FM 2755 12" Water Line	\$ 723,000
Project 14 - CR 541 12" Water Line	\$ 892,000
Project 15 - CR 587 12" Water Line	\$ 1,873,000
Project 16.1 - Pump Station #2 - Pressure Plane #1 Upgrades	\$ 1,978,000
Project 16.2.1 - Pump Station #2 - Phase 1 Upgrades	\$ 4,310,000
Project 16.2.2 - Pump Station #2 - Phase 2 Upgrades	\$ 4,030,000
Project 17 - King Road 20-inch Water Line	\$ 2,741,000
Project 18 - Pump Station #2 - Pressure Plane #1 - 16-inch and 12-inch Water Line	\$ 1,023,000
Project 19 - CR 486 12" Water Line	\$ 427,000
Project 20 - CR 484 1.5 MG Elevated Storage Tank	\$ 4,950,000
Project 21 - FM 2755 12" Water Line	\$ 1,588,000
Project 22 - HWY 78 12" Water Line	\$ 1,346,000
Project 23 - SH 205 12" and 8" Water Line	\$ 2,485,000

Basis for Cost Projection:

- ☒ No Design Completed
☐ Preliminary Design
☐ Final Design

Subtotal	\$ 56,254,000
Total:	\$ 56,254,000

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable construction costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Exhibit JH-4

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 8/13/2018
Project: Water Master Plan	Prepared By: SAW
KHA No.: 064474160	Checked By: TLS

Title: Project 1.1 - Pump Station #1 - Phase 1 Upgrades - 0.5 MG GST & (2) - 400 gpm pumps	Sheet: 2 of 28
--	----------------

Item No.	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Site Work	1	LS	\$ 484,000	\$ 484,000
2	Landscaping	1	LS	\$ 134,000	\$ 134,000
3	Yard Piping	1	LS	\$ 215,000	\$ 215,000
4	Pump Station	1	LS	\$ 432,000	\$ 432,000
5	Control Valve Vault	1	LS	\$ 178,000	\$ 178,000
6	Ground Storage Tank	1	LS	\$ 714,000	\$ 714,000
7	Electrical	1	LS	\$ 514,000	\$ 514,000

Basis for Cost Projection:

- ☐ No Design Completed
☐ Preliminary Design
☒ Final Design

Subtotal	\$ 2,671,000
Total:	\$ 2,671,000

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable construction costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Exhibit JH-4

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 8/13/2018
Project: Water Master Plan	Prepared By: SAW
KHA No.: 064474160	Checked By: TLS

Title: Project 1.2 - Pump Station #1 - Phase 2 Upgrades - 1 MG GST & (2) - 700 gpm pumps	Sheet: 3 of 28
--	----------------

Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 63,000	\$ 63,000
2	1.0 MG Ground Storage Tank	1	LS	\$ 1,100,000	\$ 1,100,000
3	700 gpm pump	2	EA	\$ 7,000	\$ 14,000
4	Excavation & Backfill	1	LS	\$ 85,000	\$ 85,000
5	Mixer	1	LS	\$ 8,000	\$ 8,000
6	Electrical & SCADA	1	LS	\$ 50,000	\$ 50,000

Basis for Cost Projection:

- ☒ No Design Completed
☐ Preliminary Design
☐ Final Design

Subtotal		\$ 1,320,000
Contingency	25%	\$ 330,000
Eng/ Survey/ CCA Fees	20%	\$ 264,000
Total:		\$ 1,914,000

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable construction costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Exhibit JH-4

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 8/13/2018
Project: Water Master Plan	Prepared By: SAW
KHA No.: 064474160	Checked By: TLS

Title: Project 1.3 - Pump Station #1 - Phase 3 Upgrades - 1 MG GST & (4) - 1,700 gpm pumps	Sheet: 4 of 28
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 66,000	\$ 66,000
2	1 0 MG Ground Storage Tank	1	LS	\$ 1,100,000	\$ 1,100,000
3	1,700 gpm pump	4	EA	\$ 16,000	\$ 64,000
4	Excavation & Backfill	1	LS	\$ 85,000	\$ 85,000
5	Mixer	1	LS	\$ 8,000	\$ 8,000
6	Electrical & SCADA	1	LS	\$ 50,000	\$ 50,000
Basis for Cost Projection:				Subtotal	\$ 1,373,000
<input checked="" type="checkbox"/>	No Design Completed			Contingency	25% \$ 344,000
<input type="checkbox"/>	Preliminary Design			Eng/ Survey/ CCA Fees	20% \$ 275,000
<input type="checkbox"/>	Final Design			Total:	\$ 1,992,000

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable construction costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Exhibit JH-4

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 8/13/2018
Project: Water Master Plan	Prepared By: SAW
KHA No.: 064474160	Checked By: TLS

Title: Project 2 - CR 586 12-inch Water Line	Sheet: 5 of 28
--	----------------

Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 45,000	\$ 45,000
2	12" Water Line	6,900	LF	\$ 110	\$ 759,000
3	12" Gate Valve (1 per 2,000 LF of pipe)	3	EA	\$ 6,000	\$ 18,000
4	Trench Safety	6,900	LF	\$ 2	\$ 13,800
5	Seed, Fertilizer, and Erosion Control	6,900	LF	\$ 5	\$ 34,500
6	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	7	EA	\$ 7,000	\$ 49,000
7	Connect to Existing Water Line	4	EA	\$ 5,000	\$ 20,000
Basis for Cost Projection.					
<input checked="" type="checkbox"/>	No Design Completed	Subtotal			\$ 940,000
<input type="checkbox"/>	Preliminary Design	Contingency			25% \$ 235,000
<input type="checkbox"/>	Final Design	Eng/ Survey/ CCA Fees			20% \$ 188,000
			Total \$ 1,363,000		

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable construction costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Exhibit JH-4

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 8/13/2018
Project: Water Master Plan	Prepared By: SAW
KHA No.: 064474160	Checked By: TLS

Title: Project 3 - CR 483, CR 484, and CR 535 12" Water Line	Sheet: 6 of 28
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 117,000	\$ 117,000
2	12" Water Line	18,190	LF	\$ 110	\$ 2,000,900
3	12" Gate Valve (1 per 2,000 LF of pipe)	9	EA	\$ 6,000	\$ 54,000
4	Trench Safety	18,190	LF	\$ 2	\$ 36,380
5	Seed, Fertilizer, and Erosion Control	18,190	LF	\$ 5	\$ 90,950
6	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	18	EA	\$ 7,000	\$ 126,000
7	Connect to Existing Water Line	6	EA	\$ 5,000	\$ 30,000

Basis for Cost Projection:

- ☒ No Design Completed
☐ Preliminary Design
☐ Final Design

Subtotal	\$ 2,456,000
Contingency 25%	\$ 614,000
Eng/ Survey/ CCA Fees 20%	\$ 492,000
Total:	\$ 3,562,000

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable construction costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Exhibit JH-4

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 8/13/2018
Project: Water Master Plan	Prepared By: SAW
KHA No.: 064474160	Checked By: TLS

Title: Project 4 - FM 2755 12" Water Line	Sheet: 7 of 28
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 66,000	\$ 66,000
2	12" Water Line	10,200	LF	\$ 110	\$ 1,122,000
3	12" Gate Valve (1 per 2,000 LF of pipe)	5	EA	\$ 6,000	\$ 30,000
4	Trench Safety	10,200	LF	\$ 2	\$ 20,400
5	Seed, Fertilizer, and Erosion Control	10,200	LF	\$ 5	\$ 51,000
6	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	10	EA	\$ 7,000	\$ 70,000
7	Connect to Existing Water Line	4	EA	\$ 5,000	\$ 20,000

Basis for Cost Projection:

- ☒ No Design Completed
☐ Preliminary Design
☐ Final Design

Subtotal		\$ 1,380,000
Contingency	25%	\$ 345,000
Eng/ Survey/ CCA Fees	20%	\$ 276,000
Total:		\$ 2,001,000

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable construction costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Exhibit JH-4

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 8/13/2018
Project: Water Master Plan	Prepared By: SAW
KHA No.: 064474160	Checked By: TLS

Title: Project 5 - CR 541 8" Water Line	Sheet: 8 of 28
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Item No.	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 13,000	\$ 13,000
2	8" Water Line	2,025	LF	\$ 90	\$ 182,250
3	8" Gate Valve	2	EA	\$ 5,000	\$ 10,000
4	Trench Safety	2,025	LF	\$ 2	\$ 4,050
5	Seed, Fertilizer, and Erosion Control	2,025	LF	\$ 5	\$ 10,125
6	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	2	EA	\$ 7,000	\$ 14,000
7	Connect to Existing Water Line	4	EA	\$ 5,000	\$ 20,000
Basis for Cost Projection:					
<input checked="" type="checkbox"/>	No Design Completed	Subtotal			\$ 254,000
<input type="checkbox"/>	Preliminary Design	Contingency			25% \$ 64,000
<input type="checkbox"/>	Final Design	Eng/ Survey/ CCA Fees			20% \$ 51,000
			Total: \$ 369,000		

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable construction costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Exhibit JH-4

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 8/13/2018
Project: Water Master Plan	Prepared By: SAW
KHA No.: 064474160	Checked By: TLS

Title: Project 6 - PR 5400 8" Water Line	Sheet: 9 of 28
--	----------------

Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 39,000	\$ 39,000
2	8" Water Line	7,100	LF	\$ 90	\$ 639,000
3	8" Gate Valve	4	EA	\$ 5,000	\$ 20,000
4	Trench Safety	7,100	LF	\$ 2	\$ 14,200
5	Seed, Fertilizer, and Erosion Control	7,100	LF	\$ 5	\$ 35,500
6	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	7	EA	\$ 7,000	\$ 49,000
7	Connect to Existing Water Line	2	EA	\$ 5,000	\$ 10,000
Basis for Cost Projection: <input checked="" type="checkbox"/> No Design Completed <input type="checkbox"/> Preliminary Design <input type="checkbox"/> Final Design					Subtotal \$ 807,000 Contingency 25% \$ 202,000 Eng/ Survey/ CCA Fees 20% \$ 162,000 Total: \$ 1,171,000

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable construction costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Exhibit JH-4

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 8/13/2018
Project: Water Master Plan	Prepared By: SAW
KHA No.: 064474160	Checked By: TLS

Title: Project 7 - CR 486 12" Water Line	Sheet: 10 of 28
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 59,000	\$ 59,000
2	12" Water Line	9,000	LF	\$ 110	\$ 990,000
3	12" Gate Valve (1 per 2,000 LF of pipe)	5	EA	\$ 6,000	\$ 30,000
4	Trench Safety	9,000	LF	\$ 2	\$ 18,000
5	Seed, Fertilizer, and Erosion Control	9 000	LF	\$ 5	\$ 45,000
6	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	9	EA	\$ 7,000	\$ 63,000
7	Connect to Existing Water Line	4	EA	\$ 5,000	\$ 20,000
Basis for Cost Projection:					
<input checked="" type="checkbox"/>	No Design Completed	Subtotal			\$ 1,225,000
<input type="checkbox"/>	Preliminary Design	Contingency			25% \$ 307,000
<input type="checkbox"/>	Final Design	Eng/ Survey/ CCA Fees			20% \$ 245,000
			Total.		
			\$ 1,777,000		

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Exhibit JH-4

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 8/13/2018
Project: Water Master Plan	Prepared By: SAW
KHA No.: 064474160	Checked By: TLS

Title: Project 8 - Prarie View Lane - 1.0 MG Elevated Storage Tank	Sheet: 11 of 28
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 108,000	\$ 108,000
2	1 0 MG Elevated Storage Tank	1	LS	\$ 2,000,000	\$ 2,000,000
3	Site Work & Yard Piping	1	LS	\$ 100,000	\$ 100,000
4	Electrical / SCADA	1	LS	\$ 50,000	\$ 50,000

- Basis for Cost Projection:**
- ☒ No Design Completed
- ☐ Preliminary Design
- ☐ Final Design

Subtotal		\$ 2,258,000
Contingency	25%	\$ 565,000
Eng/ Survey/ CCA Fees	20%	\$ 452,000
Total:		\$ 3,275,000

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable construction costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Exhibit JH-4

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 8/13/2018
Project: Water Master Plan	Prepared By: SAW
KHA No.: 064474160	Checked By: TLS

Title: Project 9 - Prairie View Lane 8" Water Line	Sheet: 12 of 28
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 47,000	\$ 47,000
2	8" Water Line	8,532	LF	\$ 90	\$ 767,880
3	8" Gate Valve	8	EA	\$ 5,000	\$ 40,000
4	Trench Safety	8,532	LF	\$ 2	\$ 17,064
5	Seed, Fertilizer, and Erosion Control	8,532	LF	\$ 5	\$ 42,660
6	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	8	EA	\$ 7,000	\$ 56,000
7	Connect to Existing Water Line	2	EA	\$ 5,000	\$ 10,000
Basis for Cost Projection:				Subtotal	\$ 981,000
<input checked="" type="checkbox"/>	No Design Completed			Contingency	25% \$ 246,000
<input type="checkbox"/>	Preliminary Design			Eng/ Survey/ CCA Fees	20% \$ 197,000
<input type="checkbox"/>	Final Design			Total:	\$ 1,424,000

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable construction costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Exhibit JH-4

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 8/13/2018
Project: Water Master Plan	Prepared By: SAW
KHA No.: 064474160	Checked By: TLS

Title: Project 10 - Northstar Road 8" Water Line	Sheet: 13 of 28
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 57,000	\$ 57,000
2	8" Water Line	10,465	LF	\$ 90	\$ 941,850
3	8" Gate Valve	8	EA	\$ 5,000	\$ 40,000
4	Trench Safety	10,465	LF	\$ 2	\$ 20,930
5	Seed, Fertilizer, and Erosion Control	10,465	LF	\$ 5	\$ 52,325
6	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	10	EA	\$ 7,000	\$ 70,000
7	Connect to Existing Water Line	2	EA	\$ 5,000	\$ 10,000
Basis for Cost Projection:				Subtotal	\$ 1,193,000
<input checked="" type="checkbox"/>	No Design Completed			Contingency	25% \$ 299,000
<input type="checkbox"/>	Preliminary Design			Eng/ Survey/ CCA Fees	20% \$ 239,000
<input type="checkbox"/>	Final Design			Total:	\$ 1,731,000

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable construction costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Exhibit JH-4

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 8/13/2018
Project: Water Master Plan	Prepared By: SAW
KHA No.: 064474160	Checked By: TLS

Title: Project 11 - Prince Lane 8" Water Line	Sheet: 14 of 28
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Item No.	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 44,000	\$ 44,000
2	8" Water Line	8,027	LF	\$ 90	\$ 722,430
3	8" Gate Valve	6	EA	\$ 5,000	\$ 30,000
4	Trench Safety	8,027	LF	\$ 2	\$ 16,054
5	Seed, Fertilizer, and Erosion Control	8,027	LF	\$ 5	\$ 40,135
6	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	8	EA	\$ 7,000	\$ 56,000
7	Connect to Existing Water Line	3	EA	\$ 5,000	\$ 15,000
Basis for Cost Projection:			Subtotal		\$ 924,000
<input checked="" type="checkbox"/>	No Design Completed	Contingency		25%	\$ 231,000
<input type="checkbox"/>	Preliminary Design	Eng/ Survey/ CCA Fees		20%	\$ 185,000
<input type="checkbox"/>	Final Design	Total:			\$ 1,340,000

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable construction costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids or actual construction costs will not vary from its opinions of probable costs.

Exhibit JH-4

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 8/13/2018
Project: Water Master Plan	Prepared By: SAW
KHA No.: 064474160	Checked By: TLS

Title: Project 12 - CR 483 12" Water Line	Sheet: 15 of 28
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 109,000	\$ 109,000
2	12" Water Line	16,720	LF	\$ 110	\$ 1,839,200
3	12" Gate Valve (1 per 2,000 LF of pipe)	9	EA	\$ 6,000	\$ 54,000
4	Trench Safety	16,720	LF	\$ 2	\$ 33,440
5	Seed, Fertilizer, and Erosion Control	16,720	LF	\$ 5	\$ 83,600
6	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	17	EA	\$ 7,000	\$ 119,000
7	Connect to Existing Water Line	7	EA	\$ 5,000	\$ 35,000
Basis for Cost Projection:				Subtotal	\$ 2,274,000
<input checked="" type="checkbox"/>	No Design Completed			Contingency	25% \$ 569,000
<input type="checkbox"/>	Preliminary Design			Eng/ Survey/ CCA Fees	20% \$ 455,000
<input type="checkbox"/>	Final Design			Total:	\$ 3,298,000

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable construction costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Exhibit JH-4

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 8/13/2018
Project: Water Master Plan	Prepared By: SAW
KHA No.: 064474160	Checked By: TLS

Title: Project 13 - FM 2755 12" Water Line	Sheet: 16 of 28
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 24,000	\$ 24,000
2	12" Water Line	3,640	LF	\$ 110	\$ 400,400
3	12" Gate Valve (1 per 2,000 LF of pipe)	2	EA	\$ 6,000	\$ 12,000
4	Trench Safety	3,640	LF	\$ 2	\$ 7,280
5	Seed, Fertilizer, and Erosion Control	3,640	LF	\$ 5	\$ 18,200
6	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	3	EA	\$ 7,000	\$ 21,000
7	Connect to Existing Water Line	3	EA	\$ 5,000	\$ 15,000
Basis for Cost Projection:					
<input checked="" type="checkbox"/>	No Design Completed	Subtotal			\$ 498,000
<input type="checkbox"/>	Preliminary Design	Contingency			25% \$ 125,000
<input type="checkbox"/>	Final Design	Eng/ Survey/ CCA Fees			20% \$ 100,000
			Total: \$ 723,000		

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable construction costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Exhibit JH-4

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 8/13/2018
Project: Water Master Plan	Prepared By: SAW
KHA No.: 064474160	Checked By: TLS

Title: Project 14 - CR 541 12" Water Line	Sheet: 17 of 28
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Item No.	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 30,000	\$ 30,000
2	12" Water Line	4,540	LF	\$ 110	\$ 499,400
3	12" Gate Valve (1 per 2,000 LF of pipe)	2	EA	\$ 6,000	\$ 12,000
4	Trench Safety	4,540	LF	\$ 2	\$ 9,080
5	Seed, Fertilizer, and Erosion Control	4,540	LF	\$ 5	\$ 22,700
6	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	3	EA	\$ 7,000	\$ 21,000
7	Connect to Existing Water Line	4	EA	\$ 5,000	\$ 20,000
Basis for Cost Projection:					
<input checked="" type="checkbox"/>	No Design Completed	Subtotal			\$ 615,000
<input type="checkbox"/>	Preliminary Design	Contingency			25% \$ 154,000
<input type="checkbox"/>	Final Design	Eng/ Survey/ CCA Fees			20% \$ 123,000
			Total: \$ 892,000		

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable construction costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Exhibit JH-4

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 8/13/2018
Project: Water Master Plan	Prepared By: SAW
KHA No.: 064474160	Checked By: TLS

Title: Project 15 - CR 587 12" Water Line	Sheet: 18 of 28
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 62,000	\$ 62,000
2	12" Water Line	9,620	LF	\$ 110	\$ 1,058,200
3	12" Gate Valve (1 per 2,000 LF of pipe)	5	EA	\$ 6,000	\$ 30,000
4	Trench Safety	9,620	LF	\$ 2	\$ 19,240
5	Seed, Fertilizer, and Erosion Control	9,620	LF	\$ 5	\$ 48,100
6	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	9	EA	\$ 7,000	\$ 63,000
7	Connect to Existing Water Line	2	EA	\$ 5,000	\$ 10,000
Basis for Cost Projection:				Subtotal	\$ 1,291,000
<input checked="" type="checkbox"/> No Design Completed				Contingency 25%	\$ 323,000
<input type="checkbox"/> Preliminary Design				Eng/ Survey/ CCA Fees 20%	\$ 259,000
<input type="checkbox"/> Final Design				Total:	\$ 1,873,000

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable construction costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Exhibit JH-4

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 8/13/2018
Project: Water Master Plan	Prepared By: SAW
KHA No.: 064474160	Checked By: TLS

Title: Project 16.1 - Pump Station #2 - Pressure Plane #1 Upgrades	Sheet: 19 of 28
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 65,000	\$ 65,000
2	1.0 MG Ground Storage Tank	1	LS	\$ 1,100,000	\$ 1,100,000
3	1200 gpm pump	4	EA	\$ 14,000	\$ 56,000
4	Excavation & Backfill	1	LS	\$ 85,000	\$ 85,000
5	Mixer	1	LS	\$ 8,000	\$ 8,000
6	Electrical & SCADA	1	LS	\$ 50,000	\$ 50,000

Basis for Cost Projection:

- ☒ No Design Completed
☐ Preliminary Design
☐ Final Design

Subtotal		\$ 1,364,000
Contingency	25%	\$ 341,000
Eng/ Survey/ CCA Fees	20%	\$ 273,000
Total:		\$ 1,978,000

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Exhibit JH-4

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 8/13/2018
Project: Water Master Plan	Prepared By: SAW
KHA No.: 064474160	Checked By: TLS

Title: Project 16.2.1 - Pump Station #2 - Phase 1 Upgrades	Sheet: 20 of 28
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 90,000	\$ 90,000
2	2 0 Million Gallon Type III Concrete GST	1	LS	\$ 1,200,000	\$ 1,200,000
3	Mixer	1	EA	\$ 50,000	\$ 50,000
4	Tank Excavation (Includes Ramp, Track, & Hauling Soil Offsite)	22,000	CY	\$ 30	\$ 660,000
5	Tank Subgrade Preparation	1	LS	\$ 96,000	\$ 96,000
6	Import Backfill	13,500	CY	\$ 25	\$ 337,500
7	Stabilization of Tank Construction Areas	1	LS	\$ 82,000	\$ 82,000
8	2,200 GPM Vertical Turbine Pump & Can (Outside)	2	EA	\$ 60,000	\$ 120,000
9	Electrical Building, SCADA, Instrumentation, & HVAC	1	LS	\$ 150,000	\$ 150,000
10	Yard Piping	1	LS	\$ 25,000	\$ 25,000
11	Concrete Slab for Pumps	30	SY	\$ 100	\$ 3,000
12	Concrete Sidewalk Around GST	130	SY	\$ 60	\$ 7,800
13	SWPPP	1	LS	\$ 5,000	\$ 5,000
14	Connect to Existing Water Line	1	EA	\$ 5,000	\$ 5,000
15	Electromagnetic Flow Meter	1	LS	\$ 10,000	\$ 10,000
16	ARV's	4	EA	\$ 5,000	\$ 20,000
17	Site Grading	1	LS	\$ 50,000	\$ 50,000
18	Groundwater Drainage Lift Station	1	LS	\$ 50,000	\$ 50,000
19	Metal Roof for Pumps	1	LS	\$ 10,000	\$ 10,000

Basis for Cost Projection:

- ☒ No Design Completed
☐ Preliminary Design
☐ Final Design

Subtotal		\$ 2,972,000
Contingency	25%	\$ 743,000
Eng/ Survey/ CCA Fees	20%	\$ 595,000
Total:		\$ 4,310,000

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Exhibit JH-4

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 8/13/2018
Project: Water Master Plan	Prepared By: SAW
KHA No.: 064474160	Checked By: TLS

Title: Project 16.2.2 - Pump Station #2 - Phase 2 Upgrades	Sheet: 21 of 28
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Item No.	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 90,000	\$ 90,000
2	2 0 Million Gallon Type III Concrete GST	1	LS	\$ 1,200,000	\$ 1,200,000
3	Mixer	1	EA	\$ 50,000	\$ 50,000
4	Tank Excavation (Includes Ramp, Track, & Hauling Soil Offsite)	22,000	CY	\$ 30	\$ 660,000
5	Tank Subgrade Preparation	1	LS	\$ 96,000	\$ 96,000
6	Import Backfill	13,500	CY	\$ 25	\$ 337,500
7	Stabilization of Tank Construction Areas	1	LS	\$ 82,000	\$ 82,000
8	2,200 GPM Vertical Turbine Pump & Can (Outside)	2	EA	\$ 60,000	\$ 120,000
9	Yard Piping	1	LS	\$ 25,000	\$ 25,000
10	Concrete Sidewalk Around GST	130	SY	\$ 60	\$ 7,800
11	SWPPP	1	LS	\$ 5,000	\$ 5,000
12	Connect to Existing Water Line	1	EA	\$ 5,000	\$ 5,000
13	Electromagnetic Flow Meter	1	LS	\$ 10,000	\$ 10,000
14	ARV's	4	EA	\$ 5,000	\$ 20,000
15	Site Grading	1	LS	\$ 20,000	\$ 20,000
16	Groundwater Drainage Lift Station	1	LS	\$ 50,000	\$ 50,000

Basis for Cost Projection:

- ☒ No Design Completed
☐ Preliminary Design
☐ Final Design

Subtotal		\$ 2,779,000
Contingency	25%	\$ 695,000
Eng/ Survey/ CCA Fees	20%	\$ 556,000
Total:		\$ 4,030,000

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable construction costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Exhibit JH-4

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 8/13/2018
Project: Water Master Plan	Prepared By: SAW
KHA No.: 064474160	Checked By: TLS

Title: Project 17 - King Road 20-inch Water Line	Sheet: 22 of 28
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 90,000	\$ 90,000
2	20" Water Line	8,590	LF	\$ 190	\$ 1,632,100
3	20" Butterfly Valve (1 per 2,000 LF of pipe)	4	EA	\$ 9,000	\$ 36,000
4	Trench Safety	8,590	LF	\$ 2	\$ 17,180
5	Seed, Fertilizer, and Erosion Control	8,590	LF	\$ 5	\$ 42,950
6	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	8	EA	\$ 7,000	\$ 56,000
7	Connect to Existing Water Line	3	EA	\$ 5,000	\$ 15,000
Basis for Cost Projection:				Subtotal	\$ 1,890,000
<input checked="" type="checkbox"/> No Design Completed				Contingency 25%	\$ 473,000
<input type="checkbox"/> Preliminary Design				Eng/ Survey/ CCA Fees 20%	\$ 378,000
<input type="checkbox"/> Final Design				Total:	\$ 2,741,000

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable construction costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Exhibit JH-4

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client:	Bear Creek SUD	Date:	8/13/2018
Project:	Water Master Plan	Prepared By:	SAW
KHA No.:	064474160	Checked By:	TLS

Title:	Project 18 - Pump Station #2 - Pressure Plane #1 - 16-inch and 12-inch Water Line	Sheet:	23 of 28
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Item No.	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 34,000	\$ 34,000
2	16" Water Line	2,200	LF	\$ 160	\$ 352,000
3	16" Butterfly Valve (1 per 2,000 LF of pipe)	2	EA	\$ 8,000	\$ 16,000
4	Bore with 30" Steel Casing	115	LF	\$ 900	\$ 103,500
5	12" Water Line	1,100	LF	\$ 110	\$ 121,000
6	12" Gate Valve	2	EA	\$ 6,000	\$ 12,000
7	Trench Safety	3,300	LF	\$ 2	\$ 6,600
8	Seed, Fertilizer, and Erosion Control	2,200	LF	\$ 5	\$ 11,000
9	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	4	EA	\$ 7,000	\$ 28,000
10	Connect to Existing Water Line	4	EA	\$ 5,000	\$ 20,000

Basis for Cost Projection:

- ☒ No Design Completed
☐ Preliminary Design
☒ Final Design

Subtotal		\$ 705,000
Contingency	25%	\$ 177,000
Eng/ Survey/ CCA Fees	20%	\$ 141,000
Total:		\$ 1 023 000

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable construction costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Exhibit JH-4

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 8/13/2018
Project: Water Master Plan	Prepared By: SAW
KHA No.: 064474160	Checked By: TLS

Title: Project 19 - CR 486 12" Water Line	Sheet: 24 of 28
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 14,000	\$ 14,000
2	12" Water Line	1,970	LF	\$ 110	\$ 216,700
3	12" Gate Valve (1 per 2,000 LF of pipe)	1	EA	\$ 6,000	\$ 6,000
4	Trench Safety	1,970	LF	\$ 2	\$ 3,940
5	Seed, Fertilizer, and Erosion Control	1,970	LF	\$ 5	\$ 9,850
6	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	4	EA	\$ 7,000	\$ 28,000
7	Connect to Existing Water Line	3	EA	\$ 5,000	\$ 15,000
Basis for Cost Projection: <input checked="" type="checkbox"/> No Design Completed <input type="checkbox"/> Preliminary Design <input type="checkbox"/> Final Design					Subtotal \$ 294,000 Contingency 25% \$ 74,000 Eng/ Survey/ CCA Fees 20% \$ 59,000 Total: \$ 427,000

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable construction costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Exhibit JH-4

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client:	Bear Creek SUD	Date:	8/13/2018
Project:	Water Master Plan	Prepared By:	SAW
KHA No.:	064474160	Checked By:	TLS

Title:	Project 20 - CR 484 1.5 MG Elevated Storage Tank	Sheet:	25 of 28
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 163,000	\$ 163,000
2	1.5 MG Elevated Storage Tank	1	LS	\$ 3,000,000	\$ 3,000,000
3	Site Work & Yard Piping	1	LS	\$ 100,000	\$ 100,000
4	Demolish and Depose of Existing 300,000 gallon EST	1	LS	\$ 100,000	\$ 100,000
5	Electrical / SCADA	1	LS	\$ 50,000	\$ 50,000

Basis for Cost Projection:

- ☒ No Design Completed
☐ Preliminary Design
☐ Final Design

Subtotal		\$ 3,413,000
Contingency	25%	\$ 854,000
Eng/ Survey/ CCA Fees	20%	\$ 683,000
Total:		\$ 4,950,000

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable construction costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Exhibit JH-4

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 8/13/2018
Project: Water Master Plan	Prepared By: SAW
KHA No.: 064474160	Checked By: TLS

Title: Project 21 - FM 2755 12" Water Line	Sheet: 26 of 28
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 53,000	\$ 53,000
2	12" Water Line	8,090	LF	\$ 110	\$ 889,900
3	12" Gate Valve (1 per 2,000 LF of pipe)	4	EA	\$ 6,000	\$ 24,000
4	Trench Safety	8,090	LF	\$ 2	\$ 16,180
5	Seed, Fertilizer, and Erosion Control	8,090	LF	\$ 5	\$ 40,450
6	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	8	EA	\$ 7,000	\$ 56,000
7	Connect to Existing Water Line	3	EA	\$ 5,000	\$ 15,000
Basis for Cost Projection:					
<input checked="" type="checkbox"/>	No Design Completed	Subtotal			\$ 1,095,000
<input type="checkbox"/>	Preliminary Design	Contingency			25% \$ 274,000
<input type="checkbox"/>	Final Design	Eng/ Survey/ CCA Fees			20% \$ 219,000
			Total: \$ 1,588,000		

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable construction costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

Exhibit JH-4

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 8/13/2018
Project: Water Master Plan	Prepared By: SAW
KHA No.: 064474160	Checked By: TLS

Title: Project 22 - HWY 78 12"Water Line	Sheet: 27 of 28
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 45,000	\$ 45,000
2	12" Water Line	6,730	LF	\$ 110	\$ 740,300
3	12" Gate Valve (1 per 2,000 LF of pipe)	4	EA	\$ 6,000	\$ 24,000
4	Trench Safety	6,730	LF	\$ 2	\$ 13,460
5	Seed, Fertilizer, and Erosion Control	6,730	LF	\$ 5	\$ 33,650
6	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	8	EA	\$ 7,000	\$ 56,000
7	Connect to Existing Water Line	3	EA	\$ 5,000	\$ 15,000

Basis for Cost Projection:

- ☒ No Design Completed
☐ Preliminary Design
☐ Final Design

Subtotal	\$ 928,000
Contingency 25%	\$ 232,000
Eng/ Survey/ CCA Fees 20%	\$ 186,000
Total:	\$ 1,346,000

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Exhibit JH-4

Kimley-Horn & Associates, Inc.

Opinion of Probable Construction Cost

Client: Bear Creek SUD	Date: 8/13/2018
Project: Water Master Plan	Prepared By: SAW
KHA No.: 064474160	Checked By: TLS

Title: Project 23 - SH 205 12" and 8" Water Line	Sheet: 28 of 28
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Item No	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization, Bonds, and Insurance	1	LS	\$ 82,000	\$ 82,000
2	12" Water Line	9,320	LF	\$ 110	\$ 1,025,200
3	12" Gate Valve (1 per 2 000 LF of pipe)	5	EA	\$ 6,000	\$ 30,000
4	8" Water Line	4,230	EA	\$ 90	\$ 380,700
5	8" Gate Valve	2	EA	\$ 5,000	\$ 10,000
6	Trench Safety	13,550	LF	\$ 2	\$ 27,100
7	Seed, Fertilizer, and Erosion Control	13,550	LF	\$ 5	\$ 67,750
8	Fire Hydrant Assembly (1 per 1000 LF of Pipe)	10	EA	\$ 7,000	\$ 70,000
9	Connect to Existing Water Line	4	EA	\$ 5,000	\$ 20,000
Basis for Cost Projection:				Subtotal	\$ 1,713,000
<input checked="" type="checkbox"/>	No Design Completed			Contingency	25% \$ 429,000
<input type="checkbox"/>	Preliminary Design			Eng/ Survey/ CCA Fees	20% \$ 343,000
<input type="checkbox"/>	Final Design			Total:	\$ 2,485,000

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable construction costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.