



LITTLE ELK CREEK VILLAGE

Property Management Plan

PITKIN COUNTY, COLORADO

DHM DESIGN

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Prepared By: DHM DESIGN



Little Elk Creek Village
Home Owners Association

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Executive Summary

This Management Plan (Plan) was developed by DHM Design Corporation (DHM) for Little Elk Creek Village Home Owners Association (LECV) (HOA). The purpose of this Plan is to inform and assist current and future Home Owners Association Board (Board) members and association home owners in stewardship planning, identification and implementation of capital maintenance and improvement projects at LECV. The intent of the Plan is to provide the following:

- A comprehensive review of current existing conditions and management recommendations for HOA open space property including: Water Resources and infrastructure (ditches and ponds), water rights, overall ecological conditions (vegetation, wildlife, fisheries).
- Provide clear short term and long term management recommendations for the HOA open space properties.
- Assist the HOA in identifying appropriate professional service contractors to complete needed maintenance of HOA resources.

Additional information for the HOA's potable water system was provided by Dan Harris, an HOA member and acting potable water system manager. This information has been included in the Plan for reference and use for current and future potable water system management. A professional engineer should be consulted for all potable infrastructure improvement. This Management Plan is adaptive by nature and it is recommended that it be updated as necessary by the Board as capital improvement projects are completed and stewardship goals and objectives change.

1.0 Management Plan Process

The development of this Management Plan occurred over the spring and summer of 2022. DHM Design ecological planning staff reviewed existing documentation provided by the HOA including:

- Little Elk Creek Management Doc DRAFT
- The Little Elk Creek Manager position
- Little Elk Creek Village Water System (Wright Water Engineers)
- As-Built Survey dated 4-SEP-1975, LECV Water Main & Storage Tank
- Deed of Easement between Rolling Meadows, Inc. and Little Elk Creek Associates
- Composite Map, for Zoline, Water Line Easements to LECV, dated 28-OCT-1974
- As-Built Survey dated 4-SEP-1975, LECV Water Main & Storage Tank
- Little Elk Creek Village HOA water rights and resources (our file #1118 A)
- Amendment to Agreement between Andy Wiessner (Owner of Wiessner Property) and Little Elk Creek Village Homeowners Association (LECV)(HOA)
- 1986 Burke Easement

The documentation provided is summarized accordingly throughout the Plan. This documentation is also included in *Appendix C– Supporting Documentation*. In addition to the documentation provided, data was collected in the field using the ArcCollector application on a handheld mobile device connected to an external GNSS receiver. This data was processed in ArcGIS Pro and utilized for the development of this plan. Data was collected for the following:

Raw water infrastructure:

- Check dams
- Culverts
- Ditches
- Ditch conveyance diversions
- Headgates
- Measuring devices
- Pump take-out locations

Potable water infrastructure:

- Water tank
- Pumphouse
- Main line gate valves
- Hydrant valves

Natural Resources:

- Noxious and nuisance vegetation
- Vegetation management zones (willows)
- Aquatic vegetation management zone

Data and mapping for the Plan has been inventoried and is included in an online mapping software ArcGIS online. This map can be found here: <https://arcg.is/14rP8q0>. The data included in the map can be updated and revised as needed. Additional information on the mapping software is included in **Section 9.0** – ArGIS Mapping System. A public meeting was conducted on August 17, 2022 for HOA members and input from that meeting was incorporated into the Plan. Additional in person and onsite interviews were conducted as part of the process and all information gathered to date has been included as part of this Plan.

2.0 Little Elk Creek Village Property Overview

Little Elk Creek Village is a residential subdivision which was platted in the early 1970's and consists of a total of 150 acres divided into 77 lots. The subdivision is located adjacent to Little Elk Creek and Capitol Creek in Sections 4 and 5, Township 9 South, Range 86 West, 6th P.M., Pitkin County, Colorado (**Figure 1**). Little Elk Creek Village is situated along the terraced valley floor of Capitol Creek. There are common open space areas which include a playground, picnic tables and ponds.

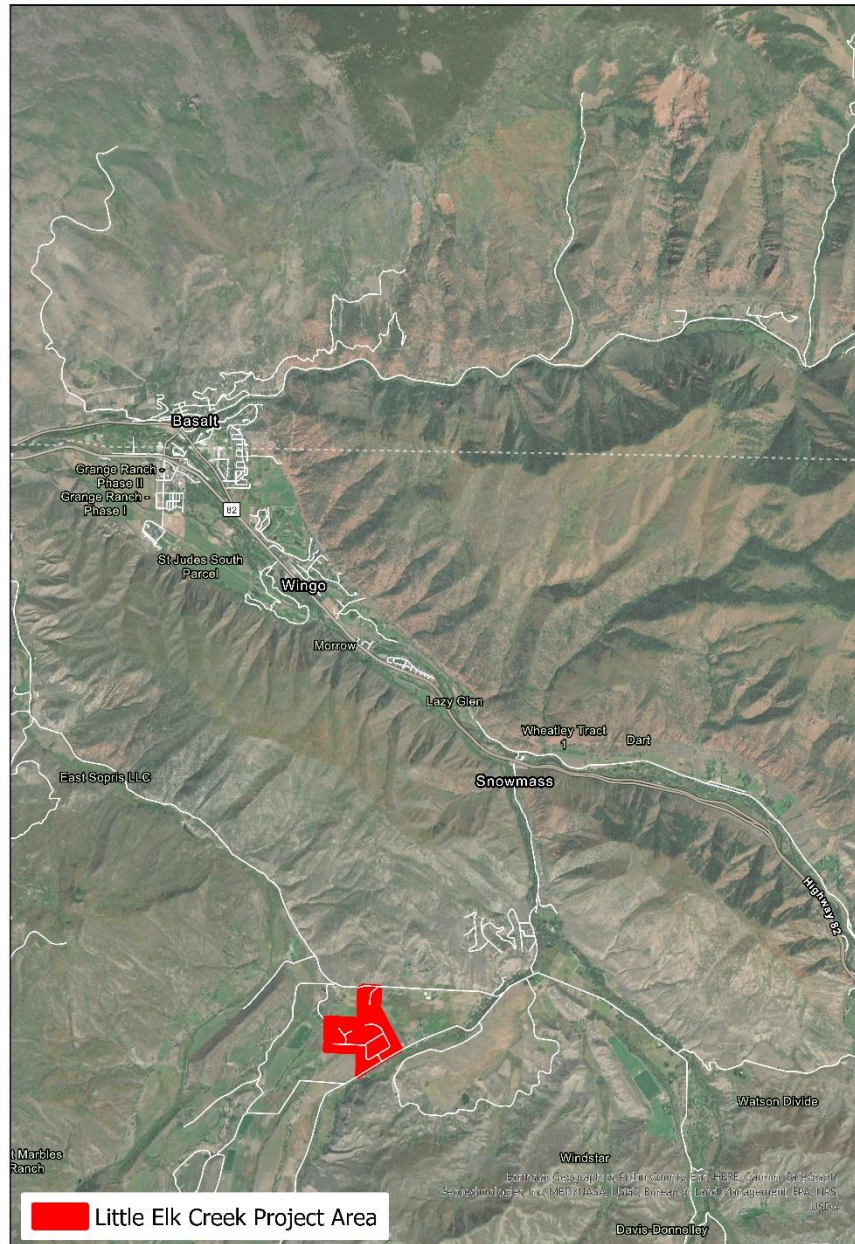


Fig. 1 - Little Elk Creek Project Location Map

LITTLE ELK CREEK HOA

Figure 1 - Project Location Map

3.0 Existing Inventory and Analysis Summary

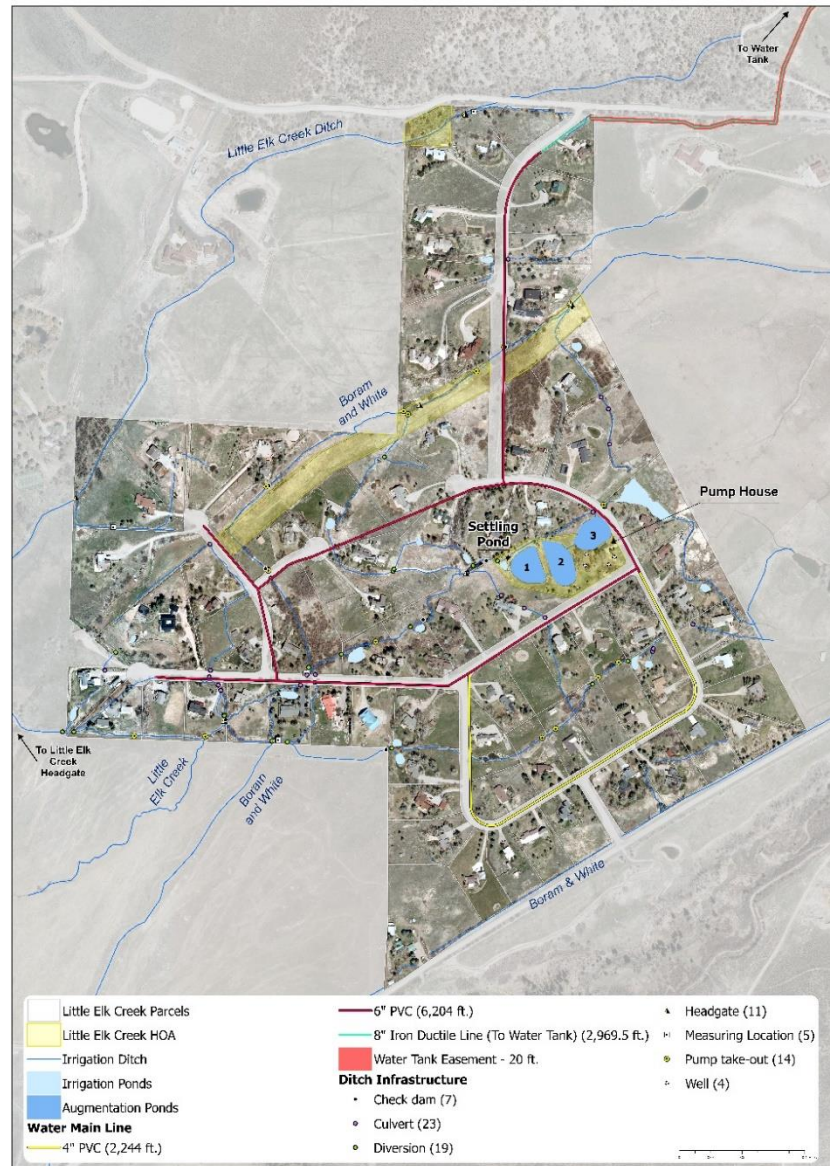
To assist in identifying capital improvement and stewardship priorities, an existing inventory and analysis of the HOA’s natural resources and raw water infrastructure were completed. Additional inventory and mapping of potable water infrastructure were completed to support future infrastructure maintenance and improvement projects. This Plan does not include any physical analysis of the condition of existing potable water infrastructure. A description of existing conditions analysis and recommendations are included in subsequent sections below.

3.1 Open Space, Ponds and Ditch System

DHM Design ecological services staff completed field surveys of approximately 15 acres. The assessment included the entirety of the ditch systems and open space parcels (**Figure 2**).

For the open space parcels and ditch systems, assessments were completed for existing condition of vegetation including type, composition and densities of noxious and nuisance vegetation. Areas where high concentrations of noxious and nuisance vegetation were observed were mapped with a point and data for species type was collected. This mapping data is provided in *Appendix B – Vegetation and Pond Management Maps*.

Findings and recommendations are included in **Section 6.0 – Vegetation Management**.



Appendix A - Water Infrastructure Maps
 Fig. 1 - Water Infrastructure Overview
 LITTLE ELK CREEK HOA



Figure 2 – Assessment Area and Water Infrastructure Overview Map

The ditch systems were walked and associated infrastructure was mapped and assessed for integrity and function. The mapping for ditch infrastructure is included in *Appendix A – Water Infrastructure Maps (Figures 1-5)*. Findings and recommendations specific to ditch infrastructure and improvements are included in **Section 3.4 – Ditch System Analysis and Recommendations Summary**.

The augmentation ponds were evaluated for overall function and health. Aquatic vegetation was identified and densities were mapped. Recommendations for pond management are included in **Section 7 – Pond Health Analysis and Management Recommendations**.

3.2 Little Elk Creek HOA Water Rights Summary

A summary of Little Elk Creek water rights is included below. This summary was derived from the following documentation:

- Little Elk Creek Subdivision Water Rights Evaluation (Wright Water Engineers - August 15, 1980)
- District Court, Water Division NO. 5, State of Colorado Case No. 84-CW-285 – Application
- Little Elk Creek Village HOA Water Rights and Resources (our file # 1118 A)

Additional information on well water rights can be found in *Appendix C – Supporting Documentation*.

3.2.1 Domestic Water

The Property is located within the Little Elk Creek Subdivision, and thus receives its treated domestic water from the Little Elk Creek Community Water System. The HOA's domestic water is sourced from the following four wells:

- Well No. 1, permitted under Well Permit No. 056888-F;
- Well No. 2, permitted under Well Permit No. 056889-F;
- Well No. 3, permitted under Well Permit No. 056890-F; and
- Well No. 4, permitted under Well Permit No. 056891-F;

These wells have been mapped and are shown in *Appendix A – Water Infrastructure Maps*. According to the review completed by Waterlaw in 2013, the wells are permitted to each pump at a maximum rate of 60 gallons of water per minute (GPM), and to produce a combined total of 22 acre-feet of water per year. The Well Construction and Test Reports attached to Permit Nos., 056888-F, 056889-F, and 56891-F show that the wells pump at a considerable sustained pumping rates of 15+, 15+, and 10 GPM respectively.

Well Nos. 1-4 are fully augmented by the Plan for augmentation decreed to Little Elk Creek Village in Case No. 84CW285, Division 5 Water Court. A plan for augmentation is a court-approved water supply plan that enables a junior water right to continue diverting or a junior or

well to continue pumping during water-short periods when that structure would otherwise get curtailed or shut-off to benefit more senior water rights. The plan does this by replacing an amount of water equivalent to the junior depletions back into the stream. The fact that Well Nos. 1-4 are fully augmented means that they can provide the HOA with domestic water on a year-round basis (Waterlaw 2013).

3.2.2 Irrigation Water

The HOA receives irrigation water from both Little Elk Ditch and Boram and White Ditch. According to Wright Water Engineers report, the 150 acres which comprises the Little Elk Creek development was created from the 550 acre Gallun Ranch. The Gallun Ranch was purchased by Joseph Zoline in 1969, and subsequently he sold parts of the ranch. For the purposes of distributing the water rights appurtenant to the Gallun Ranch to buyers, it was determined that 1 acre would receive 1/550ths of the appurtenant water rights. Therefore, when Inghem & Associates purchased 150 acres for creation of the Little Elk Creek subdivision, they were conveyed 150/550ths, or 27% of all water rights appurtenant to the Gallun Ranch.

A. Little Elk Ditch

According to the Waterlaw review, in 1983, all of the owners of water rights in the Little Elk Ditch were incorporated into the Little Elk Creek Ditch Company (the “Ditch Company”). A mutual ditch company is a Colorado non-profit corporate structure under which a group of water rights holders combine their water rights and/or ditch rights concerning a specific ditch. The company then, in turn, issues stock in proportion to each shareholder’s original water rights or ditch structure ownership interests. The company also takes over responsibility for administrating, operating, maintaining and repairing the ditch, as well as allocating costs amongst and providing insulation from liability for shareholders.

The Ditch Company’s corporate notebook states that the HOA originally held 14,375 out of the 50,000 issued shares in the Company (28.75%). Subsequently, the Company re-issued its stock based on 10,000 shares outstanding. The HOA currently holds 2,875 of the 10,000 shares (28.75%). The HOA owns three (3) rights to Little Elk Ditch totaling 3.5 cubic feet per second (cfs.). These rights are shown in **Table 1** below.

Table 1- Water Rights Associated with Little Elk Ditch

Priority	Case No.	Adjudication Date	Appropriation Date	Amount (cfs)
143	CAO132	5-11-1889	4-25-1886	0.8
207A	CA1042	3-18-1904	6-1-1889	2.44
310	CA3082	8-25-1936	6-1-1890	0.26
			DITCH TOTAL	3.5
LECV WATER OWNERSHIP IN LITTLE ELK CREEK DITCH (26%)				0.91

B. Boram and White Ditch

According to the Waterlaw review and per the decree in Case No. 84CW285, Little Elk Creek Subdivision ownership interest in the Boram and White Ditch is 27%, or 4.347 cfs of the water rights listed in **Table 2**. In Case No. 84CW285, Little Elk Creek Village applied to the water court to use a portion of its water rights in the Boram and White Ditch as the source of augmentation water for Well Nos. 1-4 . All of the Boram and White Ditch water rights are very senior on Capital Creek and should be satisfied every year. In fact, Priority 9 is the most senior water right on the stream. The State's diversion records confirm that this ditch consistently diverts full amounts of water from May through September in years of average precipitation. In years of high precipitation, water is available through October. In years of extremely low precipitation, water is generally not available past September.

Table 2 - Water Rights Associated with Boram and White Ditch

Priority	Case No.	Adjudication Date	Appropriation Date	Amount {cfs}
9	CA0132	5-11-1889	5-5-1881	2.5
57	CA0132	5-11-1889	4-10-1883	2.6
174A	CA0132	5-11-1889	5-1-1887	1.0
421F	CA3082	8-25-1936	6-5-1920	10.0
			DITCH TOTAL	16.1
LECV WATER OWNERSHIP IN BORAM AND WHITE DITCH (27%)			TOTAL	4.347

The Boram and White Ditch also has a decreed duty of water of 1 cfs for 50 acres. This means that under Colorado law, the ditch can irrigate up to 805 acres. In Case No. 84CW285, Little Elk Creek Village permanently dedicated 2.647 cfs of its 4.347 cfs in the water right to be used as the source of augmentation water for Well Nos. 1-4. This means that the HOA has 1.7 cfs. remaining to use for irrigation purposes (9.9% of the total water decreed to the ditch). The HOA's water can thus irrigate up to 85 acres. The State's diversion records report that in recent years, the ditch has been irrigating between 145 and 171.36 acres. While it is impossible to determine how many of those acres are within the HOA, 9.9% equals between 14.3 and 16.7 acres. The Wright Water Engineers report estimated that in 1983, Boram and White Ditch water irrigated 80 acres within the Little Elk Creek Village.

Based on Waterlaw’s review, the HOA holds 2,875 shares of stock in the Little Elk Creek Ditch Company. Little Elk and Boram and White Ditches provide sufficient irrigation water supply to the HOA and Property and both water rights are very senior on Capital Creek. The State's diversion records demonstrate that these rights provide adequate amounts of water throughout the irrigation season. Additionally, the water rights are decreed to irrigate up to 170 acres - far more acreage than is located within the Little Elk Creek Village Subdivision. The fact that the water rights may currently only be irrigating between 46 and 68 acres aligns with the reality of a 77 home subdivision with houses, driveways, and other developed surfaces. It is understood that the Property itself has approximately 0.25 acre of irrigated lawns and gardens.

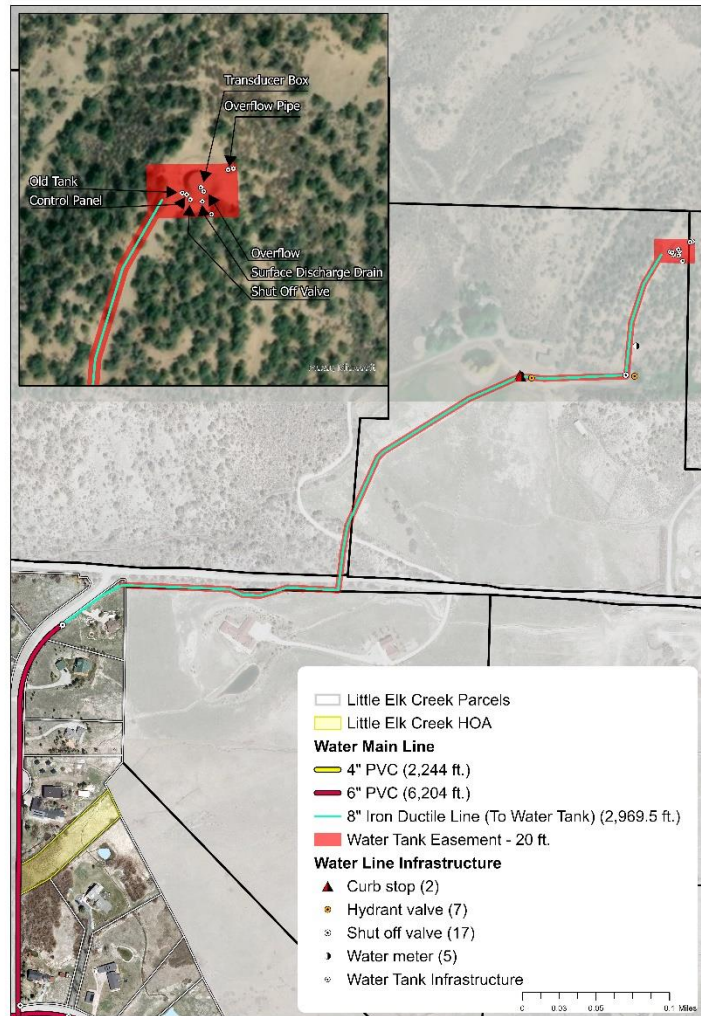
C. Augmentation Ponds

There are three (3) augmentation reservoirs (ponds) located within the subdivision. These ponds serve as part of the subdivision augmentation plan. These reservoirs were designed to store approximately 5 acre-feet to account for evaporative losses and to store the unused portion of the historic consumptive use. The stored water in these ponds is to be released during the winter months (October-April). A review of the water recordation documents provided by the HOA describes this action.

3.3 Property Covenants and Easements

Currently, there are two property easements associated with LECV water infrastructure. They include a water tank easement at 6500 East Sopris Creek Road and an easement for the “holding” ponds (augmentation ponds) located within the HOA. A brief summary of each easement is included below, copies of the individual easements are included in *Appendix C - Supporting Documentation*. Rolling Meadows Inc. Easement (Wiessner Property) A previous owner of the Wiessner Property (located at 6650 E. Sopris Creek Road, Snowmass, CO 81654) executed an original agreement with LECVHA to construct three water tanks on the Wiessner Property in return for the Property being able to utilize water from the tanks for domestic use, without charge, via a tap from the tanks (Figure 3. According to the Agreement and Deed of Easement provided, this agreement was recorded on June 21, 1976. The agreement is between Rolling Meadows, Inc. and Little Elk Creek Associates in which Rolling Meadows “grants and conveys a perpetual right-of-way to construct, operate, maintain, replace and remove such domestic

water system, consisting of water storage tanks, buried water pipes, underground wires, and



Appendix A - Water Infrastructure Maps
Fig. 3 - Water Tank Infrastructure
LITTLE ELK CREEK HOA

Figure 3 - Water Tank Infrastructure Maps (showing water tank easement)

other underground appurtenances on, over, under and across the land which the undersigned owns or in which the undersigned has any interest in” the aforementioned easement area.

The original agreement was amended on January 18, 1994 by a new agreement between Brownlee Cote (then owner of the Wiessner Property), recorded at Book 752, Page 268, Pitkin County Records (the “1994 Agreement”), to allow LECV to replace the three tanks with a new 100,000 gallon tank;

“WHEREAS, in return for the new 100,000 gallon tank on the Wiessner Property authorized by the 1994 Agreement, the Wiessner Property was granted the authority to use the existing tap, plus a future (second) tap, and any monthly fees or future costs for such water use by the Wiessner Property were waived by LECVHA.”

A draft amendment dated June 14, 2022 was provided by LECVHA and it proposes to continue to allow the Wiessner property to utilize water from the existing LECVHA tank, or future tank or tanks, for household and irrigation use, in the approximate manner and degree that such use has occurred annually since 1988 in return for a quitclaim to LECVHA an annual sum of 5 acre-feet of water from the Wiessner Property’s water rights. The water source for the proposed 5 acre-feet is still to be determined.

B. Augmentation Pond Easement

According to the Easement Agreement provided, the augmentation pond agreement was completed on December 16, 1986 and it is between Ann Milligan Gray (Owner) and The Little Elk Creek Village Homeowners’ Association (Association). This agreement is recorded at Book 527, Page 230, Pitkin County Records (the “1986 Agreement”).

In this agreement, the Owner grants to the Association a non-exclusive easement twelve thousand two hundred (12,200) square feet of the Property, as shown in *Appendix C – Supporting Documentation*. The specified easement accommodates the aforementioned holding ponds (augmentation ponds), and any equipment necessary for the maintenance and operation of the holding ponds, and for any landscaping associated with the holding ponds.

3.4 Ditch Systems Analysis and Recommendations Summary

As described in the water rights summary, there are two (2) primary ditch systems that convey water to Little Elk Creek Subdivision and they include the Boram and White Ditch and Little Elk Ditch. Of the 70 plus homes within the subdivision, the majority (60) receive irrigation from Capitol Creek via the Boram and White Ditch and approximately 12 receive water from Little Elk Ditch.

In addition to the two primary ditches, there are numerous laterals that convey water throughout the HOA Property. A summary of each ditch system’s operations is included below. An inventory of raw water infrastructure located within the HOA boundary was completed and mapping is included in *Appendix A – Water Infrastructure Maps (Water Infrastructure Overview)*

and shown below in **Figure 3**. Additional mapping for each structure is included in Appendix A. Individual photos of each of the infrastructure item is included in *Appendix D – Photo Documentation*. A list of infrastructure type and quantity is included in **Table 3** below. A comprehensive review of raw water infrastructure is being completed by Colorado River Engineering (CRE).

Table 3- Little Elk Creek Subdivision Raw Water Infrastructure Inventory

Infrastructure Type	Quantity
Check dam	7
Culvert	23
Diversion structure	19
Headgate	11
Measuring location	5
Pump take-out	14
Total	79

Overall, there are many different types of raw water infrastructure located throughout the subdivision. These include standard design types (culverts, headgates, etc.) as well as improvised structures (rock dams, tarps, etc.). It is recommended that based off CRE’s review, infrastructure maintenance and replacement should be prioritized based on function and integrity, with higher priority given to structures that are identified as having structural integrity issues that may cause flooding in the future or have caused flooding in the past. A number of these structures have already been identified by the HOA. Installation of standardized measuring devices and control structures are also recommended to allow for improved control and consistency in water delivery, reduced maintenance and increased accuracy for State of Colorado water recordation.

In addition to individual structures improvements, continued ditch maintenance is recommended for all ditch systems throughout the subdivision. According to the current ditch managers, annual ditch maintenance occurs when the ditch is turned on and on an as needed basis to clear obstructions and repair infrastructure. It is recommended that physical maintenance include the use of mechanical equipment to excavate material as needed from the ditch systems. Several of the lateral ditches are overgrown with willows and other vegetation and would benefit from this type of maintenance. Specific recommendations and locations for willow treatments have been included in **Section 6.3 Willow Stand Treatments**. To assist with planning and budgeting, a ditch maintenance schedule by year and ditch segment has been developed and is included in **Figure 4** below. A full size map is included in *Appendix A*.

3.5 Little Elk Ditch Operations

DHM Design met and walked with Dan Oppenheimer, the current president and manager for Little Elk Ditch. The Little Elk Ditch manager is responsible for distributing water for the ditch between the 5 water users on the ditch. The new headgates will include combination locks on all headgates. It is the responsibility of the ditch manager to evenly distribute water amongst the three (3) Little Elk Creek Subdivision headgates. Water is typically turned out to ditch in April/May and off in October, depending on weather and water availability. At this time, there is no set schedule; the ditch manager walks and maintains the ditches and structures as needed.

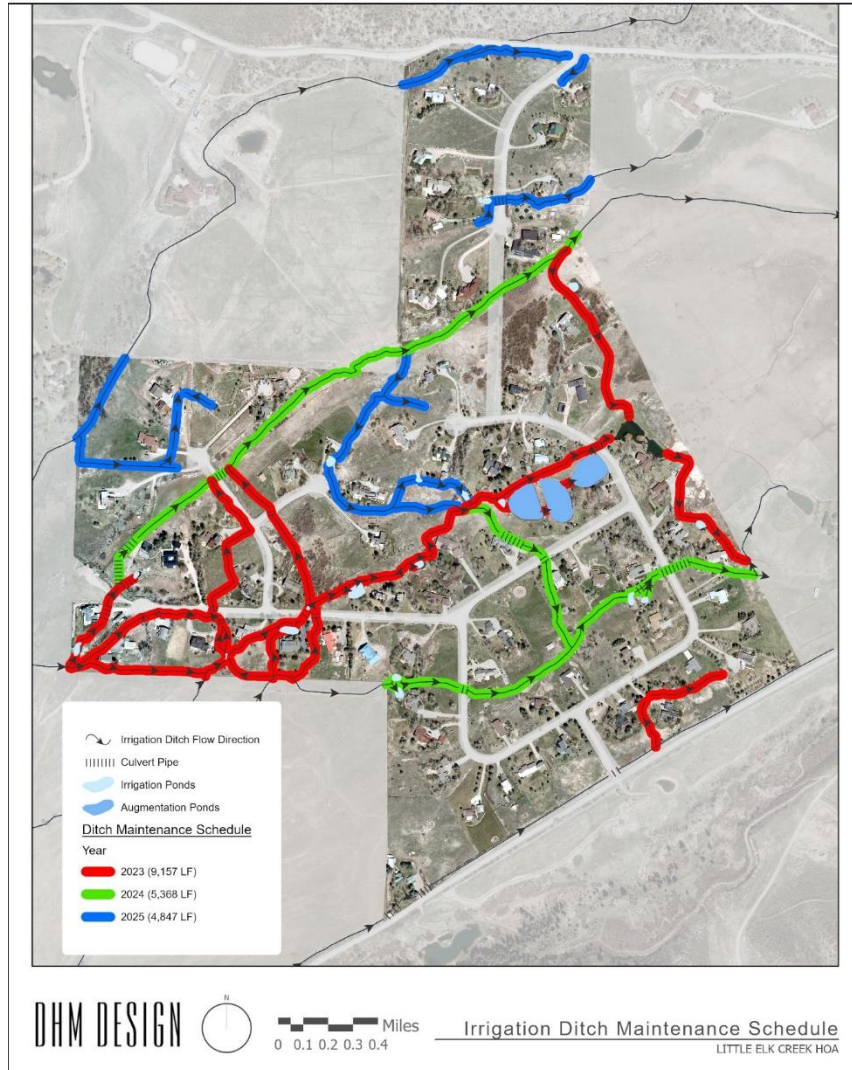


Figure 4 - Little Elk Creek Ditch Maintenance Schedule

As described in the Water Rights Summary, Little Elk Creek Subdivision owns approximately 26% or 0.91 cfs of the available water on Little Elk Ditch. Currently, the water from Little Elk Ditch is distributed through three (3) headgates along the Little Elk Creek Ditch (headgates 1-3, upstream to downstream). Current distribution of water is 0.26 cfs at each headgate, totaling 0.8 cfs. It is recommended that the current water utilization be reviewed with a water attorney to determine if it should be increased to 0.91 cfs to maximize utilization of the water rights.

The furthest downstream headgate (#3) has been recently replaced with new concrete structure (Summer 2022). The remaining two (2) headgates (#1&2) will be replaced with concrete structures in the Fall of 2022, likely November. Each headgate has an associated parshall flume to measure water, the current flume readings are included in **Table 4** below.

Table 4 - Current Little Elk Ditch Parshall Flume Readings (Provided by Dan Oppenheimer)

Structure	Size (width at throat)	Reading (ft)	Amount (cfs)
Parshall flume #1	9 inches	0.2	0.26
Parshall flume #2	3 inches	0.42	0.26
Parshall flume #3	6 inches	0.27	0.26
		Total	0.78

3.6 Boram and White Ditch Operations

The 550-acre Boram and White Ditch system is about 73% above, below and to the south of the subdivision. The HOA has 27% of the district parcels that include approximately 50 homes in the Subdivision, the remaining 15 or so parcels receive ditch water from Little Elk Creek Ditch. The headgate for the Boram and White Ditch is located on Capital Creek. This headgate was re-built in 2022. On a typical water year, water is released through the Boram and White Ditch starting at the end of April through mid-October. Currently, there is no schedule for routine ditch maintenance on the Boram and White Ditch and maintenance occurs on an as needed basis.

3.7 Potable Water Infrastructure

Inventory and mapping of potable water infrastructure were completed to support future infrastructure maintenance and improvement projects. This plan does not include any physical analysis of the condition of existing potable water infrastructure. The majority of the information included in this section extrapolated from the *Little Elk Creek – Potable Water Management Document* provided by Dan Harris, the acting potable water manager for the HOA. This document can be reviewed in its entirety in *Appendix C – Supporting Documentation*. Mr. Harris has been managing the potable water system for over 30 years and has extensive knowledge of the current operation and maintenance of the system. To inventory the potable water system, a comprehensive review of the documentation was completed and multiple site visits and meetings with Mr. Harris were conducted.

Additional consultation with a professional engineer is recommended prior to planning or completing water infrastructure improvement projects, including the replacement of the potable water distribution main line and water well infiltration improvements. Order of Magnitude (O&M) costing for the replacement of the waterline was provided by Timberline Excavation (Timberline). Timberline has completed a significant number of infrastructure projects for the HOA and they have extensive experience and familiarity with the system. These proposed projects are discussed further in the sections below.

The potable water system at Little Elk Creek Subdivision consists of four (4) water wells (3 of which are currently operational), a pump house that filters and distributes water to the system, approximately 11,417 feet of water line, a 100,000 gallon water tank and electrical infrastructure and monitoring equipment (**Figure 5**). A summary of each system component is included below.

3.7.1 Water Main Line

The water main line consists of 11,417 (approximate) linear feet and is a combination of 8 inch ductile iron, 6 inch PVC (PVC-SDR-160) and 4 inch PVC (PVC-SDR-160). The 8 inch ductile iron supply line is a single supply line to the water Storage tank. The 6 inch and 4 inch PVC lines are on a looped line system that supply water to the HOA. There are 17 shut off valves located along the main line.

3.7.2 Water Storage Tank

The water storage tank is approximately 16 feet tall and 32 feet in diameter with a 15 foot overflow pipe and has a capacity of 100,000 gallons. The steel ground storage tank is located north of the HOA and north of HOA and is accessed through right-of-way (ROW) on the Rolling Meadows Property at 6650 East Sopris Creek Road. Other water tank infrastructure includes a transducer, overflow, and surface water drains. A detailed map depicting these infrastructure items and the location of the water tank is included in *Appendix A – Water Infrastructure Maps (Water Tank Infrastructure (Fig 3))*.



Appendix A - Water Infrastructure Maps
Fig. 2 - Water Main Infrastructure Overview



Figure 5 - Water Main Infrastructure Overview

3.7.3 Water Wells

There are a total of four (4) domestic water wells located near the pump house (Figure 5). Three (3) of these wells are currently operational and two are used for water production. All three wells were installed at a depth of approximately 27-30 feet. The wells are infiltration type wells; a generalized construction diagram for well No. 1 is included in Figure 6.

3.7.4 Pump House

The pump house is located adjacent to the augmentation ponds off Little Elk Creek Ave. The pumphouse stores the filtration system, hi service pumps (HSP) and control system. Underneath the pumphouse are two (2) cisterns that store approximately 12,593 gallons of water. Water is pump from the well cisterns to through the system to the water tank.

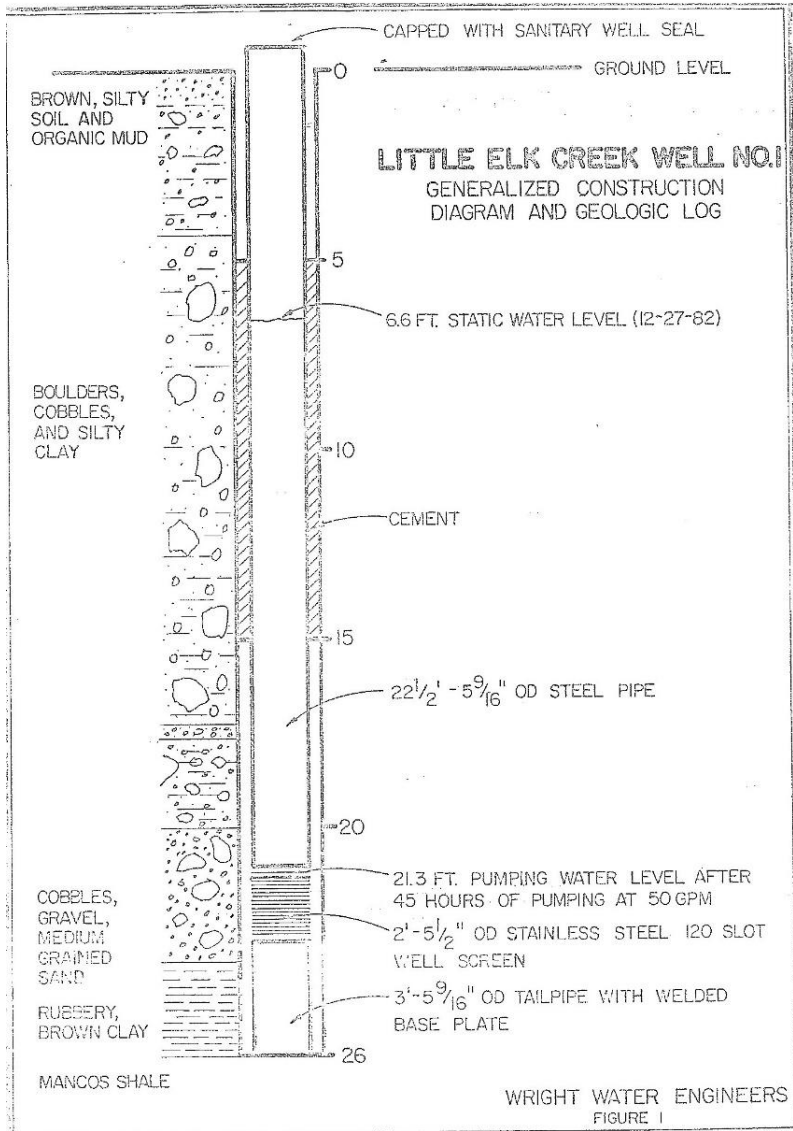


Figure 6 - Generalized Well Construction Diagram and Geologic Log

4.0 Potable Water System Operations

4.1 Operations Summary

The storage tank water level is monitored at the pump house. The storage tank has an electronic transducer which sits at the bottom of the tank and measures water pressure to show the water depth in the tank.

Full capacity of storage is 7200 gals/foot x 15 feet deep which equals 108,000 gals of stored water in the tank. Another approximately 15,000 gals. of water is stored in the water mains at any given time. If the water level in the storage tank drops from 15.00 ft. to 14.00 ft., a signal is sent to the pumphouse to turn on one high service pumps (HSP) which then pumps water into the system and starts to refill the storage tank to 15.00 ft. When the tank level reaches 15.00 ft., the transducer in the storage tank sends a radio signal to the HSP panel. This panel signals the running HSP to shut down.

The total height of the water in the cistern beneath the PH is also read by a transducer. The full level of water in the cistern is 6.9 ft. When the level in the cistern measures 6.8 ft. deep, one of the well pumps will start up. Depending on water demand and well production, a second well pump will come on at 6.6 ft.; and third, if needed, will come on if the cistern level reaches 6.4 ft.. The well pumps may run longer than the HSP to refill the cistern to 6.9'. When the cistern reaches its full level, the well pumps will turn off.

Both sets of pumps will then be off for some period of time. The length of pump shut down time will depend on: water demand which varies by the time of day and season; whether there are any leaks in the system; and which pumps are running. The control heights for both the cistern and the storage tanks can be adjusted by Kevin Madison (Western Colorado Control Specialties). His contact information is included in **Section 10.0 - Contractor Contact Information**.

The high service pump production varies for each of the three pumps from 36 gals/minute to 47 GPM. Depending on the water table, a single well pump can produce this much water. In winter, there will almost always be two well pumps running in cycle. It is possible that all three well pumps will be running occasionally, either summer or winter. If there is more than one HSP running at any time, there is a serious problem to be located and fixed. There are also some special controls that can affect this cycle: low water or high water level in cistern, turbidity levels, or chlorine levels.

If the well pumps do not turn off for some reason, before the cistern overflows onto the concrete floor of the pump house, a sensor will trigger a shutdown of the well pumps. This switch has to be manually reset; it is located on the well control panel. The water manager will have to switch on one of the HSPs manually to lower water level in cistern before resetting the switch. If the water in the cistern falls below 3 ft., an alarm will trigger and whatever high service pump is on will turn off and all the HSPs will remain off. When the cistern refills to 4 ft. 6

in. one HSP will come back on. In winter, or with a big leak, this can lead to a loop situation where the HSP turns off, then comes back on and immediately drains the cistern again. There have been times when three well pumps will pump less than one HS pump. This cycle can continue until the storage will drain down to under 14 ft. causing two high service pumps to go on. This will cause the cistern level to drop even more quickly.

The solution to this problem is to turn the #2 HSP to auto and turn the other two HSP to off. The #2 HSP has a maximum pumping rate of 38 GPM on purpose. At this rate of pumping, two or three wells will produce more water than the 38 GPM of the HSP.

This will allow the storage tank to refill without draining down the cistern under the PH.

This method was used after the Polsky fire. During that fire, a leak had developed in the ductile iron pipe to the water storage tank. Since it was unknown there was a leak during the fire, the storage tank dropped to 0' of water. It took the efforts of many folks in LECV and Timberline Excavation 3 days to find and repair this leak.

If the depth meter for the storage tank reaches 15.5 ft., it means there is a tank overflow at the storage tank. The water manager needs to shut off all three high service pumps until system reaches 1ft.'. The overflow water will cause erosion of a gulley at 6650 E Sopris Creek and is specifically prohibited by the easement agreement with that property.

4.2 Water Monitoring

In 2010, Kevin Madison of WCECS digitized the control systems and added a transducer to the clear well. He installed the Sentinel Sensaphone System that makes most of the information about water production from the wells available on the internet for the Water Manager to monitor. In March of 2022, a meter was installed to measure the well output and this measurement was added to the Sensaphone system. In the Fall of 2020, the HOA began to add individual water meters to each home. All meters are set in a meter pit located in the LECV utility easement on each property. The information from all the meters can be read by the people in charge of the water system on the Internet using the Badger Beacon website.

The information available on the Sensaphone website includes: the total amount of water pumped in gallons by the well pumps; the number of hours each pump has run (3 well pumps and 3 high service pumps); and the number of cycles each pump has run. The Sensaphone website includes information indicating the level of water in the storage tank and the level of water in the cistern along with 8 other functions.

4.3 Leak Detection

A. Initial Leak Detection

To locate a leak, the water manager should first check the Badger Beacon website. Since February of 2022, there have been at least three occasions where the metered water use has increased quickly enough to indicate a leak.

There are two main types of leaks in the water system. One is a leak between the water meter for a house and the house. The second leak is a leak between the water meter and the water main. Identified leaks to date have always been in a home's water service line or at the saddle connection of the service line to the water main. Monitoring for leaks at the four connections to each water meter should be completed if leaks are detected through the Sensaphone and Badger Systems. If the amount of water read by the meters is not increasing, but water use continues to rise, then the leak is likely on the un-metered side of some home's water service line. If a meter is suspected, the cap on the meter pit can be removed. Any water leaked at one of the meter connections will probably show up in the bottom of the meter pit. Such leaks are covered by a warranty from Timberline Excavation which installed the meters.

B. Locating Leaks on the Metered Service Line

The metered part of the service line is between the meter pit and each home. If metered water as shown on the Badger Beacon water monitor is increasing at the same rate as the overall total of pumped water from the wells, then the leak is somewhere between some home's water meter and that home. As an example, total water use (from SPS) increases from 20,000 g/d to 26,000 g/d; total metered use increases by 6,000 g/d in the same timeframe. This identical increase would indicate a leak (or excessive use of domestic water) in the metered water system.

If this seems to be the case, the initial page of the Badger Meter site (At a Glance) will show the leak in the site's Flow Health graph. Click on the arrow next to Leak Detected and the site will pull up the card or cards with a leak. Per Badger specs, a leak is detected when one meter has the same exact use between 1 AM and 2 AM for three consecutive nights.

The water manager can also sign up for early leak detection from Badger. This will alert the water manager of any continuous water use over 24 consecutive hours. This alert will not necessarily indicate a leak as it may only be an overnight use for a day or two. The Badger Meter site can be organized by location, the current water manager has the system organized by the following areas: Haystack Lane; lower Little Elk Creek Ave (from intersection of Haystack and LEC Ave south Capitol Ave; upper LEC Ave (from the Haystack intersection to the cul-de-sac at the end of LEC Ave; Katydid; Driskell; Davidson; and Alexander Ave.

If a leak is detected, the water manager can check on each zone until he finds the excess water use. The zone chart will also show each house in the zone. By looking at this chart, the location of leak and associated property can be determined. The manager can also refer to the weekly reporting statistics to determine if there is a significant change in use.

Once the water manager notifies the owner, the water manager or owner can shut off the water to the house at either curb stop at the meter pit. Usually, the curb stop key is left in the curb box itself. The owner can then open the water service for water only when it is needed. This significantly reduces the daily amount leaked until repair work can be scheduled.

5.0 Potable Water Systems Capital Improvement Projects

5.1 Water Main Line Replacement

A comprehensive analysis of the water main line was conducted to evaluate the need and timing for replacement. A general review of the specifications and life expectancy of the water line types was conducted along with Timberline Excavation. The potable water main is approximately 11,417 linear feet (lf) in length. It is segmented by both size and type, and includes the following line types:

- 4" PVC SDR 160 class – 2,244 lf.
- 6" PVC SDR 160 class – 6,204 lf.
- 8" Ductile iron – 2,969 lf.

Published literature reviews including Utah State University's - PVC Pipe Longevity Report (<https://www.uni-bell.org/Portals/0/ResourceFile/pvc-pipe-longevity-report.pdf>) suggest that the expected life cycle for PVC pipe, including class 160 mm is 75 -100 years. Ductile iron pipe is designed to last 50-75 years. The LECV HOA PVC lines were installed in 1987) and the 8 inch ductile iron line was installed in 1991, 35 and 31 years ago, respectively. Based on this information, it is assumed that the PVC pipe and ductile iron pipe will not need to be replaced in the near future. Physical scoping of the pipes could provide additional information to analyze their current integrity and condition. Other potential sources for leaks could include the saddle which connects from the PVC main line to the curb stop. The HOA has previously set aside reserve funding to complete a replacement of the water line. It is recommended that the HOA evaluate initiating pipe scoping and saddle connection assessments and replacements prior to completing replacement of the water line segments. Additional analysis with a professional engineering firm could help guide future water line replacement decisions.



Appendix A - Water Infrastructure Maps
Fig. 2 - Water Main Infrastructure Overview
LITTLE ELK CREEK HOA

Figure 7- Water Main Infrastructure Overview

6.0 Vegetation Management

6.1 Noxious Vegetation

Invasive non-native plants are widely recognized as diminishing agricultural productivity and ecological functions across the state of Colorado and throughout the western U.S. (Colorado Department of Agriculture, 2000). Due to this threat, the Colorado Noxious Weed Act was implemented which requires each county in Colorado to adopt a weed management plan (WMP). The state defines a noxious weed as: “an alien plant or parts of an alien plant that have been designated by rule as being noxious or has been declared a noxious weed by a local advisory board, and meets one of more of the following criteria: (a) aggressively invades or is detrimental to economic crops or native plant communities; (b) is poisonous to livestock; (c) is a carrier of detrimental insects, diseases, or parasites; (d) the direct or indirect effect of the presence of this plant is detrimental to the environmentally sound management of natural or agricultural ecosystems.”



Appendix B - Vegetation and Pond Management Maps

Fig. 1 - Vegetation Management

LITTLE ELK CREEK HOA



As part of the assessment of the Little Elk Creek HOA, DHM Design

Figure 8 - Vegetation Management Map

inventoried the noxious vegetation across the site, noting trends in populations and higher density infestation areas. Twelve acres of targeted treatment locations were identified based upon these assessments, largely focusing on the open space areas of the HOA parcels and along the main irrigation ditches and laterals (**Figure 8** above; Appendix B – Vegetation Management Map).

6.2 Results

A total of six (6) species classified as noxious weeds were observed within Little Elk Creek during the 2022 inventory (**Table 6**).

Table 6 - Noxious Weed Species Observed in Little Elk Creek Subdivision

Scientific Name	Common Name	¹ State List Status	² Pitkin County Management Objective
<i>Cardaria draba</i>	white top	B	Suppression
<i>Carduus acanthoides</i>	plumeless thistle	B	Eradication
<i>Cirsium arvense</i>	Canada thistle	B	Suppression
<i>Cynoglossom officinale</i>	houndstongue	B	Suppression
<i>Elaeagnus angustifolia</i>	Russian olive	B	Containment
<i>Verbascum thapsus</i>	common mullein	C	Suppression

¹*State List Status: Under the CO Noxious Weed Act, the state designates noxious weed species and categorizes them based on priority for management in Colorado. List B includes plants whose continued spread in Colorado should be halted. List C plants are those which local government has the authority to decide the management strategy.*

²*Pitkin County Management Objectives: Pitkin County has established management objectives for state listed (B) and (C) noxious weeds that occur in the county. Objectives for these species include:*

- ***Eradication:*** complete elimination of all populations of a weed.
- ***Containment:*** confinement of populations of a weed to a defined area.
- ***Suppression:*** attempt to limit the vigor and spread of populations within a region.

In general, the distribution of weeds within Little Elk Creek are primarily located along the irrigation ditches, with higher densities of infestations being located along the ditch corridors and along spoil piles and disturbance areas from ditch maintenance. These areas are identified in found in *Appendix B – Vegetation and Pond Management Maps*, and represented by point locations for each species. Scattered low density populations and individual occurrences were observed throughout the identified noxious vegetation treatment zones.

6.3 Willow Stand Management Zones

Willows (*Salix spp.*) are emblematic species of most healthy riparian systems. These ecosystems support high biodiversity, are highly productive and contain critical wildlife habitat. The hydrology of irrigation ditches throughout the west often support vigorous willow stand ecosystems providing great ecological benefit. But with these benefits come many challenges, as willow stands will often form dense thickets and make regular ditch maintenance difficult. Through field observations and utilizing areal imagery, high priority willow management zones have been established. These consist of seven (7) high density willow stands comprising a total of 1.1-acres (**Table 7**). The strategy for management is dependent on the desired aesthetics and function of the areas, with two (2) primary objectives. These objectives are not mutually

exclusive and can be utilized in conjunction with each other for different stands on the property.

1. **Cut stump treatments:** this objective prioritizes ecological benefit of willow stands by maintaining the current extent of the native stands while reducing the overall densities in key areas to allow for easier access and ditch maintenance. This can be accomplished by selectively removing approximately 50 percent of the vegetative willow growth in the prescribed zones utilizing cut-stump treatments and selective removal of willows surrounding key ditch infrastructure. This is a hands-on, labor intensive effort but allows precise actions utilizing targeted removal of plant material using chainsaws and brush cutters with a saw blade implement. Following removal of above ground biomass, stumps are treated with a systematic herbicide to kill the root system of the removed willows to prevent re-growth following treatments.

2. **Excavation of willow biomass:** this objective prioritizes ease of ditch access and maintenance by completely removing the willow biomass above and below ground – allowing for unhindered access to the ditch and key infrastructure. This objective is costly, requiring an excavator and experienced operator and leaves a much larger impact and disturbances on the land. Following excavation of willow stands, restoration to the surrounding areas is likely necessary, with ditch banks and disturbed zones of removal being restored and maintained as herbaceous vegetation.

In addition to these priority areas for willow stand management, the irrigation ditches should be maintained yearly to prevent undesired willow growth. Every fall, it is recommended that the ditches be walked and willow growth be cut back and maintained. Continued maintenance of young growth willows can be accomplished utilizing hands saws, pruners, and low volumes of herbicide.

Table 7 -Willow Stand Management Zone

Willow Stand Management Zone	Area (sq. ft.)
Zone 1	15,692
Zone 2	19,915
Zone 3	1,865
Zone 4	2,450
Zone 5	3,253
Zone 6	1,811
Zone 7	3,315
Total	48,303

6.4 Vegetation Management Recommendations

Specific management recommendations for observed noxious and nuisance weeds are included in **Table 8**, below. These recommendations are focused to eradicate and suppress noxious weeds and allow desirable plant communities to establish and persist following disturbances from construction and restoration activities.

Table 8 – Noxious and Nuisance Weed Management Recommendations

Species	Growth Notes	Recommended Control Methods	Management Notes	Effective Herbicides
<p>Canada thistle (<i>Cirsium arvense</i>)</p>	<p>Perennial - deep rooted perennial species reproducing by seed and vegetatively through rhizomatous roots. Spreads primarily through vegetative means.</p>	<p>Foliar application</p>	<p>The key to control requires repeatedly stressing established plants to diminish their energy reserves and to eliminate the seed bank. Repeated applications of herbicide and mechanical control is a good strategy to suppress this species. In late spring, newly emerged rosettes should be sprayed with an herbicide. In early summer, any above ground thistles should be cut to the ground before they go to seed. In mid-summer, a follow-up herbicide application to re-treat already sprayed plants and to treat any missed plants. During the fall, and after the first frost, another follow-up spray to re-treat already sprayed plants and to treat any individuals missed during the other applications. The fall spray is particularly important because the herbicide will have the maximum effect on the</p>	<p>aminopyralid</p>

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Species	Growth Notes	Recommended Control Methods	Management Notes	Effective Herbicides
			root system during this time of year.	
<p>Common mullein (<i>Verbascum thapsus</i>)</p>	<p>Biennial - A biennial species, mullein is a tall, unmistakable plant. It flowers from July until frost, and reproduces by seed.</p>	<p>foliar application; mechanical</p>	<p>Preventing common mullein from going to seed is the key to control, cutting, digging, or pulling prior to flowering. Herbicide may also be used for control and is ideally sprayed when it is in the rosette or early bud stages. Remove established flowers (including unopened buds) from treated plants. An application to rosettes in the fall.</p>	<p>Triclopyr</p>
<p>Houndstongue (<i>Cynoglossom officinale</i>)</p>	<p>Biennial - reproducing by seed. Produces basal rosettes in the first year, rosettes emerge in spring and fall. Flowers June - July.</p>	<p>foliar application; mechanical</p>	<p>Houndstongue can be controlled by cutting, digging, or pulling prior to flowering. Herbicide may also be used for control and is ideally sprayed when it is in the rosette or early bud stages. Remove established flowers (including</p>	<p>Aminopyralid, chlorsulfuron, metsulfuron</p>

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Species	Growth Notes	Recommended Control Methods	Management Notes	Effective Herbicides
			unopened buds) from treated plants. Be sure to treat before going to seed. or properly remove and bag all seed heads.	
Plumeless thistle (<i>Carduus acanthoides</i>)	Biennial - reproducing by seed. Produces basal rosettes in the first year, rosettes emerge in spring and fall.	foliar application; mechanical	Plumeless thistle can be controlled by cutting, digging, or pulling prior to flowering. Herbicide may also be used for control and is ideally sprayed when it is in the rosette or early bud stages in the spring - to early summer with follow-up applications to rosettes in the fall.	**aminopyralid, triclopyr
Russian olive (<i>Elaeagnus angustifolia</i>)	Perennial - shrub or small tree, reproduces by seed and lateral root systems. Flowers May to June.	Cut- stump treatments	Cut the stumps to within 1 inch of the ground, and applying herbicide to the fresh cut stump within 60 seconds of cutting, being sure to fully cover the outer cambium and phloem layer. Follow up foliar treatment's seedling and sapling recruits following cut-stump treatments.	**Triclopyr, glyphosate, imazapyr
White top (<i>Cardaria draba</i>)	Perennial - erect perennial, reproducing by seed and vegetatively through rhizomatous roots. Spreads primarily through vegetative means.	Foliar application	Given the extensive rhizomatous root systems, foliar applications at targeted time periods with systematic herbicides to deplete and kill the root reserves is most effective. Treat with foliar applications in bud to flowering stages of the plant in the spring to early	chlorsulfuron, metsulfuron

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Species	Growth Notes	Recommended Control Methods	Management Notes	Effective Herbicides
			summer. Follow-up foliar treatments to fall rosettes.	
Sweet clover (<i>Melilotus spp.</i>)	Annual to Biennial -sweet clover is a tall herbaceous plant that reproduces by seed. Seeds can remain viable in the soil for 40 years or more.	foliar application; mechanical	Preventing sweet clover from going to seed is the key to control, cutting, digging, or pulling prior to flowering. Herbicide may also be used for control and is ideally sprayed when it is in the rosette or early bud stages.	Triclopyr
Willows (<i>Salix spp.</i>)	Perennial - shrub or small tree, reproduces by seed and lateral root systems. Flowers May to June.	Cut- stump treatments	Though not noxious, willows can form dense thickets along water bodies and where hydrology is sufficient. As desired by the HOA, managing these thickets of willows can be beneficial to ditch maintenance. The goal is to not eradicate the populations, but maintain lower densities in key areas along the irrigation ditches. Targeting approximately 50% of the willow populations, cut the stumps to within 1 inch of the ground, and applying herbicide to the fresh cut stump within 60 seconds of cutting, being sure to fully cover the outer cambium and phloem layer.	Triclopyr

6.5 Implementation Plan

Combating noxious weeds and other undesirable vegetation is a long-term endeavor that requires persistence and annual monitoring. Annual monitoring is critical so the success of management actions and current patterns of weed infestations can be tracked. This information allows the management plan to be tailored to current conditions so resources are used effectively and efficiently.

This implementation plan for Little Elk Creek Village was developed based on analysis from the 2022 weed inventory, providing a strategy to significantly improve current weed issues on the property as well as prevent future weed infestations. This Plan establishes the foundation for improving the condition of the current vegetation composition and all species and control methods should be implemented routinely. All aspects of the Plan can be tailored to meet any needs, considerations, or specific goals for future weed management within LECV.

This Implementation Plan utilizes an integrated weed management approach. The specific techniques for this approach for LECV include: Cultural, Prevention, Hand Pulling, Mechanical Control, Chemical Control, and Monitoring. The following summarizes how these techniques are to be accomplished at Little Elk Creek under the implementation plan:

- 1. Cultural:** Establishing healthy composition of native vegetation with desirable plant species to outcompete weeds and prevent further invasion by weed species.
- 2. Prevention:** Plan ahead to offset weed establishment from significant soil disturbances that are expected to occur (construction) by immediately re-seeding with desirable species and closely monitoring these areas for weed establishment.
- 3. Hand Pulling:** Targeted pulling of certain noxious weeds, for example plumeless thistle or common mullein, before they go to seed to reduce the available seed bank. Hand pulled weeds should be collected, bagged and removed from site to minimize spreading seeds or plant fragments.
- 4. Mechanical:** Regularly mowing or cutting any annual weed species from going to seed. Targeted cutting (wire-trim) of weed species early in the summer and at select areas on the property to diminish the available seed bank. Cut weeds should be collected, bagged and removed from site to minimize spreading seeds or plant fragments.
- 5. Chemical:** Specific application of herbicides at optimal time periods to knock back aggressive noxious weed species observed on the property.
- 6. Monitoring:** Monitoring visits should be timed accordingly to track the distribution patterns of weed species and the success of management actions.

Implementation of successful noxious vegetation management will require close coordination between the HOA, Little Elk Creek residents and the weed control contractors. Specific weed management activities will be dictated by ditch maintenance schedules and other landscaping and development activities within LECV and treatment needs at a given time will vary. Implementation schedules describing recommendations, specific treatments, and the timeframe for those treatments at Little Elk Creek have been established for a typical year (Climatic and weather conditions will vary from year to year, influencing the exact timing of these activities) are included in **Table 9**, below.

Table 9 - Noxious and Nuisance Weed Implementation Schedule

Timing¹	Weed Management Activities
May 15	<ol style="list-style-type: none"> 1. Start of growing season vegetative conditions assessment. Review the HOA parcels and irrigation ditches for early establishment of noxious vegetation species. 2. Ditch clean-up and seed spoil piles and areas of disturbance from ditch maintenance efforts.
June 15	<ol style="list-style-type: none"> 1. Spot spray established biennial and annual species rosettes in moderate to high densities including common mullein, houndstongue, plumeless thistle and sweet clover. 2. Mechanically remove by digging low density and scattered establishment of biennial and annual species rosettes including common mullein, houndstongue, plumeless thistle and sweet clover. 3. Foliar applications to white top in the budding to flowering stage.
July 15	<ol style="list-style-type: none"> 1. Spot spray newly established biennial and annual species rosettes in moderate to high densities including common mullein, houndstongue, plumeless thistle and sweet clover. 2. Mechanically remove by digging low density and scattered establishment of biennial and annual species rosettes including common mullein, houndstongue, plumeless thistle and sweet clover. 3. Foliar applications to white top in the budding to flowering stage. 4. Foliar application to bolting Canada thistle populations. Mechanically remove any established seed heads.
August 30	<ol style="list-style-type: none"> 1. Mechanically remove any established noxious vegetation that has gone to seed by digging or pulling. Being sure to remove and properly dispose of any established seed heads. 2. Foliar application to bolting - flowering Canada thistle populations. Mechanically remove any established seed heads.
September 30	<ol style="list-style-type: none"> 1. Spot spray established fall rosettes of all biennial and perennial species. Remove and properly dispose any viable seed heads. 2. Foliar applications for cattail populations in the ponds to maintain cattail establishment.

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	<ol style="list-style-type: none">3. Cut stump treatments for woody vegetation, including Russian olive and high-density willow species along the irrigation ditches. Cut and treat approximately half the population of willows.
October 15	<ol style="list-style-type: none">1. Monitoring site visit to assess success of restoration seeding efforts and if implemented weed management actions are successful to adapt plan if needed. Assess areas for needed re-seeding efforts in the spring of 2023.2. Ditch clean-up and seed spoil piles and areas of disturbance from ditch maintenance efforts.

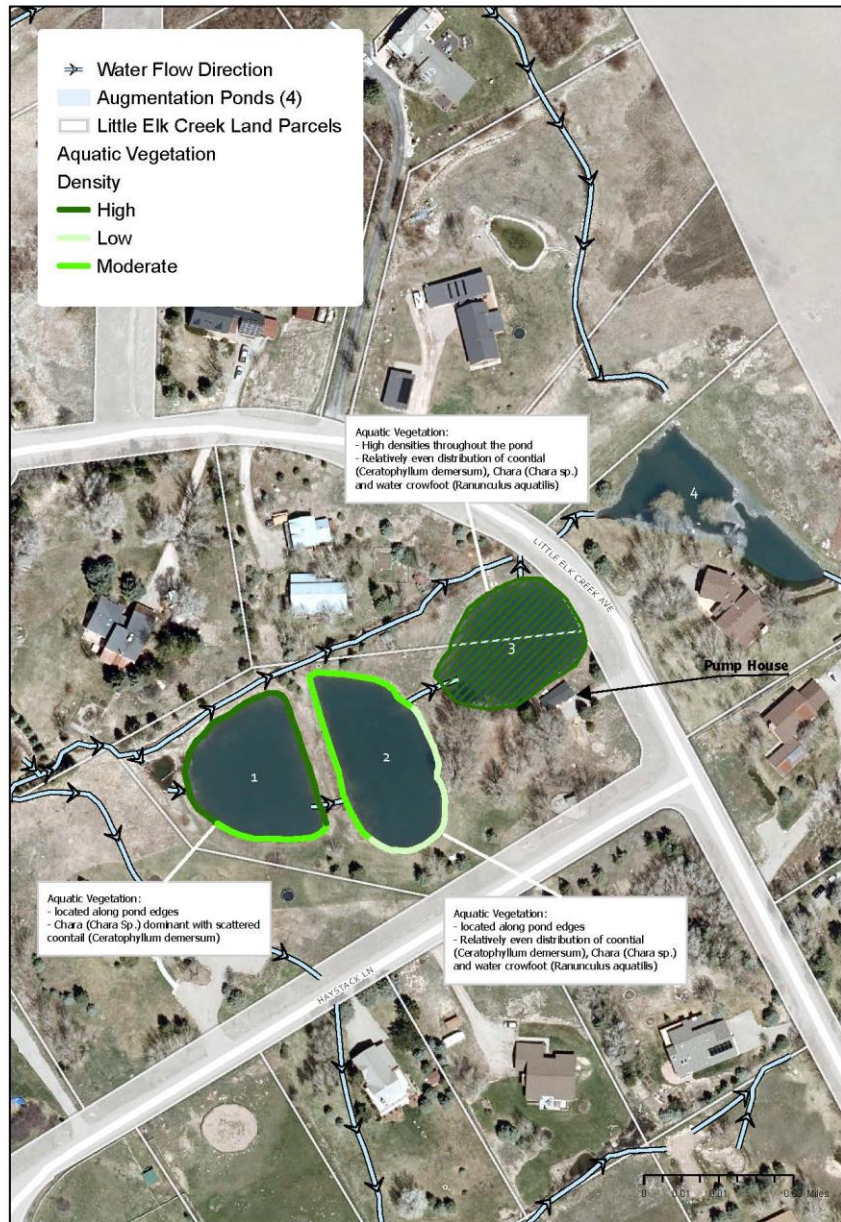
¹ *Timing recommendations are based on a typical growing season. Actual timing may vary from season to season.*

7.0 Pond Health Analysis and Management Recommendations

There are three (3) augmentation ponds located in the subdivision. For the purpose of this management plan, the ponds have been numbered relative to their location on the drainage, with Pond 1 at the upstream end and Pond 3 at the downstream end. The pond systems are fed by water from the Little Elk Creek Ditch and the Boram and White Ditch. The ponds serve as augmentation ponds to offset use of consumptive drinking water associated with the four (4) water wells. The ponds are also aesthetic features that are enjoyed by residents of the HOA.

An assessment of current pond health and function was conducted for each pond. The assessment

included an evaluation of aquatic vegetation (nuisance and non-nuisance), sediment inputs and aeration. All of these parameters play a critical role for pond health and function. Analysis results and recommendations for each pond are discussed below.



Appendix B - Vegetation and Pond Management Maps

Fig. 2 - Pond Management

LITTLE ELK CREEK HOA



Figure 9-Pond Management Map

A. Augmentation Pond 1

Pond 1 is the most upstream augmentation pond of the system. There is a small settling pond located immediately upstream and adjacent to the pond. This pond is approximately 15,282 ft² and is the second largest of the three augmentation ponds.

Overall, this pond has moderate and high densities of aquatic vegetation including chara (*Chara*), coontail (*Ceratophyllum demersum*), common water milfoil. (*Myriophyllum sibiricum*) and common water-



Figure 10 - Photo of dense chara and coontail with mat-forming algae at pond 1.

crowfoot (*Ranunculus aquatilis*). Common water-crowfoot is a plant species of the genus *Ranunculus*, native throughout most of Europe and western North America, and also northwest Africa. This is an aquatic plant, is growing in mats on the surface of water. Chara is an advanced form of algae often mistaken for a plant. Chara stabilizes bottom sediments; provides food for waterfowl and cover for fish. Chara also supports insects and other small aquatic animals, which are important foods for trout. Like Chara, coontail is a common native submerged perennial aquatic plant. Coontail is a competitive plant that can develop dense subsurface mats in high nutrient waters and displace or out-compete other native vegetation. All of these species can reach nuisance levels, causing dense mats to deplete oxygen levels that can lead to fish kills, impede recreational activities, and create mosquito habitats.

Some of the excess growth can be contributed to the amount of sediment the pond receives and the current depth (depth is decreasing due to sedimentation). Even with the settling pond, significant amounts of fine silt and sediment make it into the pond. This pond and the settling pond should be dredged every 3-5 years to allow for improved function and to help reduce aquatic vegetation growth.

Both chara and coontail area benefit aquatic vegetation but should be managed before they reach nuisance levels. In Pond 1, approximately $\frac{3}{4}$ of the shoreline (north, east, west) has high densities of chara and coontail where mat-forming algae is occurring (**Figures 9 & 10**).

Mechanical removal is recommended to continue to manage these areas and prevent further spread. High quality emergent wetlands exist on the periphery of Pond 1. These wetland fringes should be preserved to the extent possible. When accessing this pond for maintenance, equipment matting should be used to limit damages to the extent possible. Additional information on mechanical aquatic vegetation management is included in subsequent sections below. A specific implementation schedule for Pond 1 is included in **Table 10**.

B. Augmentation Pond 2

Pond 2 is located between ponds 1 and 3 (**Figure 9, pg. 29**). It is the largest of the three augmentation ponds at approximately 19,162 ft². This pond is fed by Pond 1. From a pond health perspective, Pond 2 has the least amount of aquatic vegetation and the least amount of sedimentation occurring. This can be contributed to the overall depth of the pond and that it is currently deeper than Ponds 1 and 3; it also has a more significant area of input which provides increased aeration. Aquatic vegetation observed in this pond included chara and coontail. Minimal algae matting was observed. The western and eastern edges of this pond have high quality emergent wetlands (**Figure 11**). These wetland fringes should be preserved to the extent possible. When accessing this pond for maintenance, equipment matting should be used to limit damages to the extent possible.



Figure 11- Photo of high quality emergent wetland located on western edge of Pond 2.

Regular maintenance dredging is recommended for Pond 2. In addition to dredging, clean out of the spillway drainage from Pond 1 should be completed to allow for increased aeration. This can improve overall water quality and decrease aquatic vegetation growth. Further evaluation of water utilization by a water attorney and water engineer should be completed to understand if additional water can be utilized when water temperatures increase.

C. Augmentation Pond 3

Augmentation Pond 3 is the last pond downstream of Pond 1 and Pond 2. It is the smallest of the ponds at approximately 13,347 ft². Currently, Pond 3 has the highest densities of aquatic vegetation including Chara, coontail and common water - crowfoot. Additionally, there are areas of high density cattail (*Typha*) that exists.



Figure 12 - Photo of high density ranunculus aquatilis (common crowfoot) matting occurring in Pond 3.

7.1 Pond Management Control Summary

Effectively managing aquatic plants generally involves the careful use of one or more of these management methods:

- Mechanical control
- Biological control
- Chemical control

A summary of each treatment type is included below. A specific treatment plan for each pond at LEVC is discussed at the end of this section.

7.1.1 Mechanical Control

Mechanical control methods involve removing plants manually — for example, by hand pulling or raking plants. Since most aquatic plants are perennial, they have underground portions that can resprout new shoots, so it is essential to harvest below-ground growth (roots and rhizomes) for effective control. With larger plants such as cattails, this can be difficult.

Dealers specializing in aquatic or fisheries supplies do offer hand-held devices for cutting or pulling plants in small areas. For larger bodies of water, motor-driven weed harvesters with underwater cutting blades are available. Such equipment is a major investment and may have to be operated several times during the season to effectively cut back the vegetation. The principle behind these harvesters is the same as mowing a lawn: the weeds will not be eliminated, but they can be prevented from growing to the surface and becoming a nuisance. Mechanical harvesters can successfully cut channels through vegetation. When mechanically controlling aquatic plants, harvest the cut vegetation and dump it where it cannot reenter the water. Plant fragments left to float in the water can produce new plants.

7.1.2 Biological Control

Biological control methods involve using beneficial organisms to control pest organisms. Always check with the appropriate state regulatory agency or fish and game agency before releasing a biological control agent. Biological controls have received considerable publicity and research attention. For example, certain insects have been released in the Midwest to control Eurasian watermilfoil and purple loosestrife populations. Results with Eurasian watermilfoil have been mixed, and the insect introductions for purple loosestrife are part of a long-term management plan.

The most widely used biological control agent is the grass carp (also known as the white amur). This fish is native to China and Russia and can live 15 to 20 years. Grass carp consume most submersed plants. However, grass carp prefer certain plant species more than others, so they often consume native species (such as pondweeds) before feeding on truly troublesome weeds such as Eurasian watermilfoil or mat-forming algae. Grass carp populations have the potential to denude a body of water of its underwater vegetation, so they must never be released in

natural lakes and wetland areas where vegetation is critical to fish and wildlife. The recommended stocking rates in Indiana are 15 or 30 fish per vegetated acre. The carp should be 10 to 12 inches long — smaller fish will be rapidly removed by predators such as trout. Use the lower stocking rate for most ponds so that some vegetation remains for fish habitat. The higher stocking rate can be used where total vegetation control is desired for aesthetic purposes, such as golf course ponds. Although grass carp can provide good aquatic vegetation control, it is not the solution for all ponds. Vegetation control may not be observed for a year or more, so it can be difficult to determine if enough fish are still present in the pond to be effective. After about five years, the fish slow their feeding rate, so more fish may be needed to maintain adequate vegetation.

7.1.3 Chemical Control

When properly applied, herbicides control aquatic vegetation without harming fish and wildlife. In some instances, herbicides can selectively control particular weed species without killing others. Aquatic herbicides also can fit into an aquatic plant management plan when it is desirable to treat some vegetated areas and leave others untreated. Herbicides are particularly effective for controlling invasive species such as Eurasian watermilfoil and elodia species. The herbicides discussed here are registered with the United States Environmental Protection Agency (EPA) and, when used as directed on their labels, pose no significant threat to the environment or public health. Always read and follow label directions regarding the correct use of a product and personal protective equipment. Misapplying chemicals to private or public waters is a violation of state and federal laws, and violators are responsible for any environmental damage. The appropriate state regulatory agency (Colorado Department of Agriculture) also must approve EPA-registered herbicides.

7.2 Recommendations for LECV Augmentation Ponds

Overall, the ponds at Little Elk Creek Village are functioning and in good health. The recommendations included in **Table 10** below are intended to reduce aquatic vegetation and increase overall pond health for the short and long term. Due to the ponds proximity and nexus to the potable water system, chemical applications for aquatic vegetation control are not recommended. Dredging, a form of mechanical removal, is the most effective way to remove large amounts of nuisance aquatic vegetation. Dredging activities should be completed by a licensed professional with proven experience and knowledge of working in an aquatic setting.

Little Elk Creek Village Property Management Plan

Table 10 - Pond system maintenance recommendations schedule

Control Type	Pond #1	Pond #2	Pond #3	Timeframe
Drawdown and Removal	Partial dewatering. Drawdown water to expose nuisance aquatic vegetation along shoreline (96 Hours). Use heavy equipment to remove sediment, organic matter and noxious vegetation.	Partial dewatering. Drawdown water to expose nuisance aquatic vegetation along shoreline (96 hours). Use heavy equipment to remove sediment, organic matter and noxious vegetation.	Partial or complete dewatering. Drawdown as much water as possible. Use heavy equipment to remove sediment, organic matter and noxious vegetation.	May/June 2023
Harvest/Monitoring	Monitor monthly and remove scattered noxious aquatic vegetation with hand tools	Monitor monthly and remove scattered noxious aquatic vegetation with hand tools	Monitor monthly and remove scattered noxious aquatic vegetation with hand tools	As needed throughout growing season (June-October 2023)
Increase Aeration	1. Install aeration system (compressor, line and diffusers) 2. Improve natural drainage into pond.	1. Install aeration system (compressor, line and diffusers) 2. Improve natural drainage into pond.	1. Install aeration system (compressor, line and diffusers) 2. Improve natural drainage into pond.	June 2023

8.0 Fisheries

Fish species observed in the augmentation ponds at LECV include brown trout (*Salmo trutta*). In discussions with long term residents and the HOA, it was communicated that the ponds have never been stocked and the fish that currently exists came from the ditch systems that feed the ponds. If additional fisheries stocking is desired, recommended fish stocking rates are included in **Table 11** below. General observations for macroinvertebrates were made and all ponds had good health populations of Scuds (*Gammarus spp.*), damsel flies (*Zygoptera*), mayflies (*Ephemeroptera*) and caddis (*Trichoptera*). Scuds were particularly prevalent in all three ponds. Scuds are considered an important food source for fish. Minnows were also observed.



Figure 13 - Brown trout at inlet of Pond 1.

Pond	Recommended Stocking Rate (lbs)
Pond Number 1	50 lbs
Pond Number 2	60 lbs
Pond Number 3	40 lbs

Note: Stocking rates are for trout species (rainbow, brown trout). Carp stocking for aquatic vegetation control should be reviewed and assessed with a aquatic resource professional.

9.0 ArcGIS Mapping Software

The software used to collect field data and generate mapping for this management plan is ArcGIS. The data was collected using Global navigation satellite system (GNSS) receiver connected to a handheld mobile device: IPAD mini. The software application used was ArcCollector. If the HOA decides to continue to use the mapping software into the future, an subscription to ESRI online will be required. Additional information on the mapping software and subscriptions are included below.

ArcGIS online: <https://www.arcgis.com/index.html>

GNSS Receiver: <https://eos-gnss.com/products/hardware/arrow-gold>

ArcGIS Collector: <https://www.esri.com/en-us/arcgis/products/arcgis-collector/resources>

10.0 Contractor Contact Information

A. EPC CONTACT INFORMATION

Manager/Owner: Alan Leslie, 970-379-2205. EPC OFFICE: 970-963-8393

epc@environmentalprocesscontrol.com

Mike White	970-618-4187
Aaron Giertz	970-366-7764
Jesus Velazquez	970-618-0476
Alan Leslie	970-379-2205
Linda Leslie	970-274-2255

EPC After Hours/Emergency Answering Service: 888-852-8559

Note: Water quality and water testing: Environmental Process control, EPC. Aaron Giertz from EPC has been the LEVC well technician for a number many years. He services the pumphouse and tests and replaces the filters as needed. He also adjusts the turbidity controls, the chlorine injection system and the poly-phosphate injector. EPC fills out and files the required CDPHE water quality control reports. Copies of these can be sent to the WM if he/she desires.

B. SENSAPHONE WATER MONITORING SYSTEM

Service Contact: Kevin Madison; Western Colorado Electrical Control Specialties, Inc.

Contact information: (970) 618-5680; (970) 625-4413

C. SAMUELSON PUMP COMPANY

Contact: Raun Samuelson; office, 970-945-6309; cell phone, 970-948-0893

Note: Since his work involves pumps and motors, there may be a long lead time for some tasks. It is best to alert him as soon as the water manager can if he senses that type of issue. Raun can also blow out the wells using air pressure. Each well had a water line valve near it to isolate it from the water system; then he can apply air pressure to clean the well screens and also some of the area around each well. It is best to do this in the fall so the wells are as clean as they can be heading into winter when we need as much water aquifer as we can get. This really only needs to be done every 3 to 4 years.

D. Timberline Excavation

[Office: \(970\) 927-0421](tel:(970)927-0421); [Cell: \(970\) 618-1073](tel:(970)618-1073)

11.0 Emergency Contact Information

FIRE DEPT: 911

COUNTY SHERIFF: 911

FERRELGASS (propane): 970-945-8611

CROSS PROPANE GAS & SUPPLY (propane): 970-384-2222

HOLY CROSS ENERGY: 970-945-5491

EXCEL ENERGY: 800-895-2999

BLACK HILLS ENERGY (natural gas): 800-694-8989

CO-OP (diesel): 970-963-2200

CARBONDALE CAR CARE (diesel): 970-963-1890

FIRE HYDRANT & VALVE REPAIR: John McDermott 970-948-4087

EMERGENCY WATER HAULER: Rifle Creek Pure Water 970-319-6622

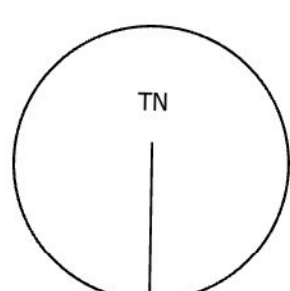
CONTROLS: Kevin Madison 970-618-5680

CDPHE Water Quality Control – Spill Hotline: 877-518-5608

Appendix A - Water Infrastructure Maps



Appendix A - Water Infrastructure Maps
 Fig. 1 - Water Infrastructure Overview

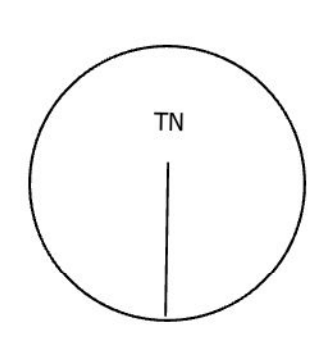
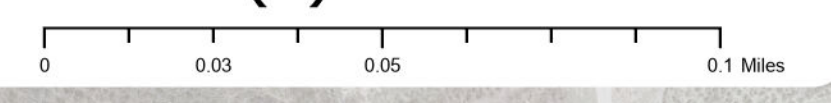


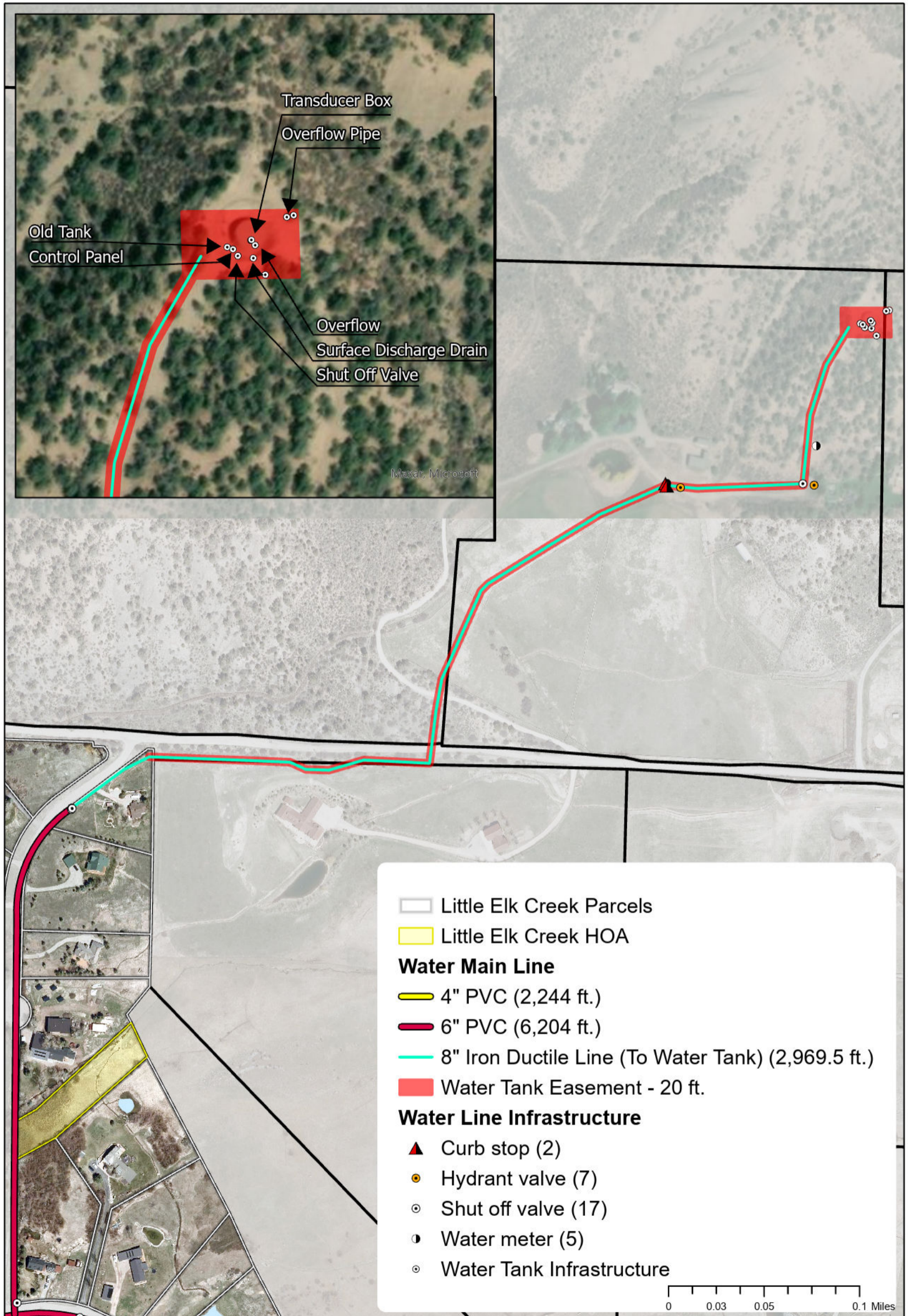


- Little Elk Creek Parcels
- Little Elk Creek HOA
- Irrigation Ditch
- Irrigation Ponds
- Augmentation Ponds

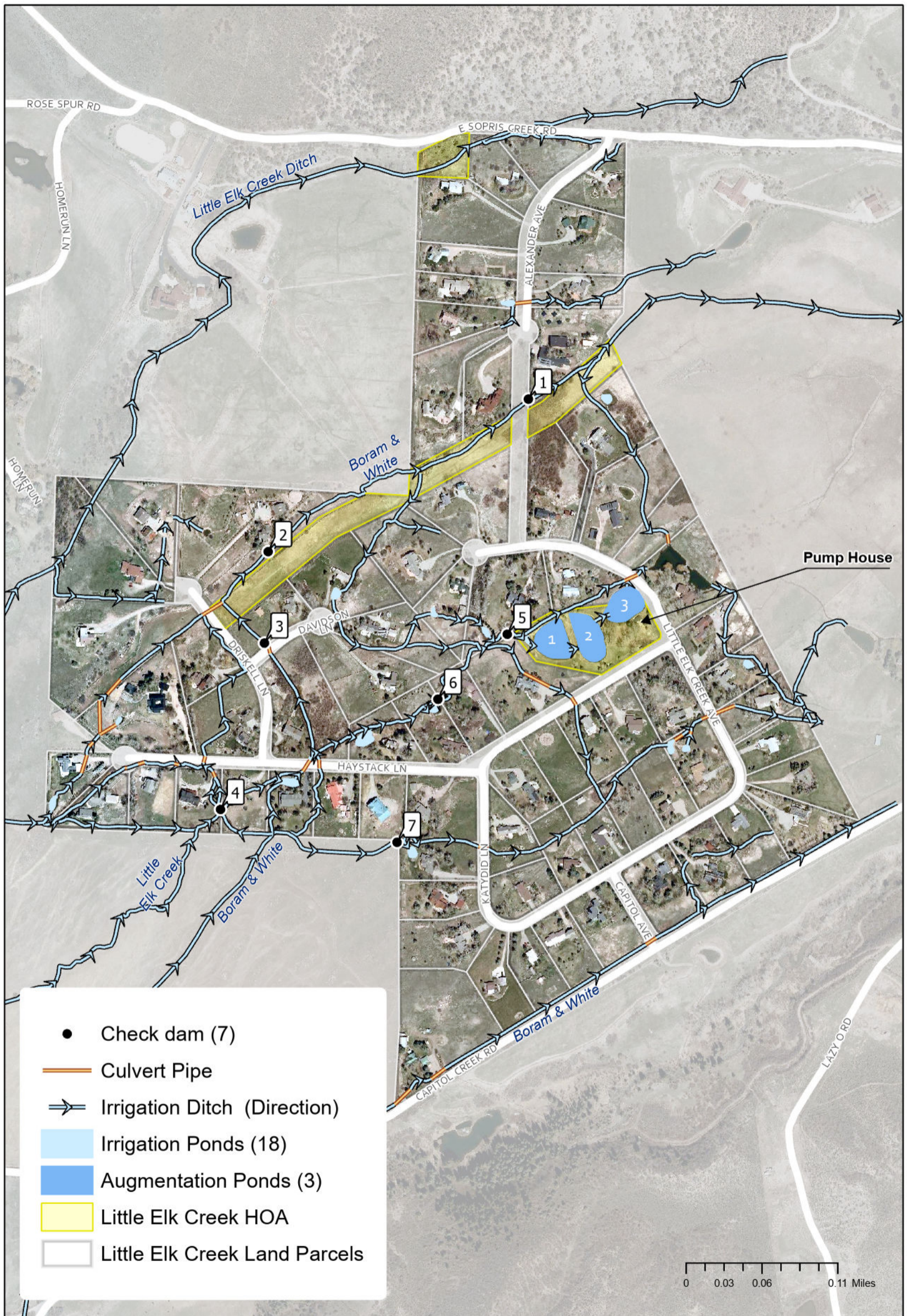
- Water Main Line**
- 4" PVC (2,244 ft.)
 - 6" PVC (6,204 ft.)
 - 8" Iron Ductile Line (To Water Tank) (2,969.5 ft.)
 - Water Tank Easement - 20 ft.

- Water Line Infrastructure**
- Hydrant valve (7)
 - Shut off valve (17)
 - Water meter (5)
 - Fire Hydrant (17)
 - Well (4)



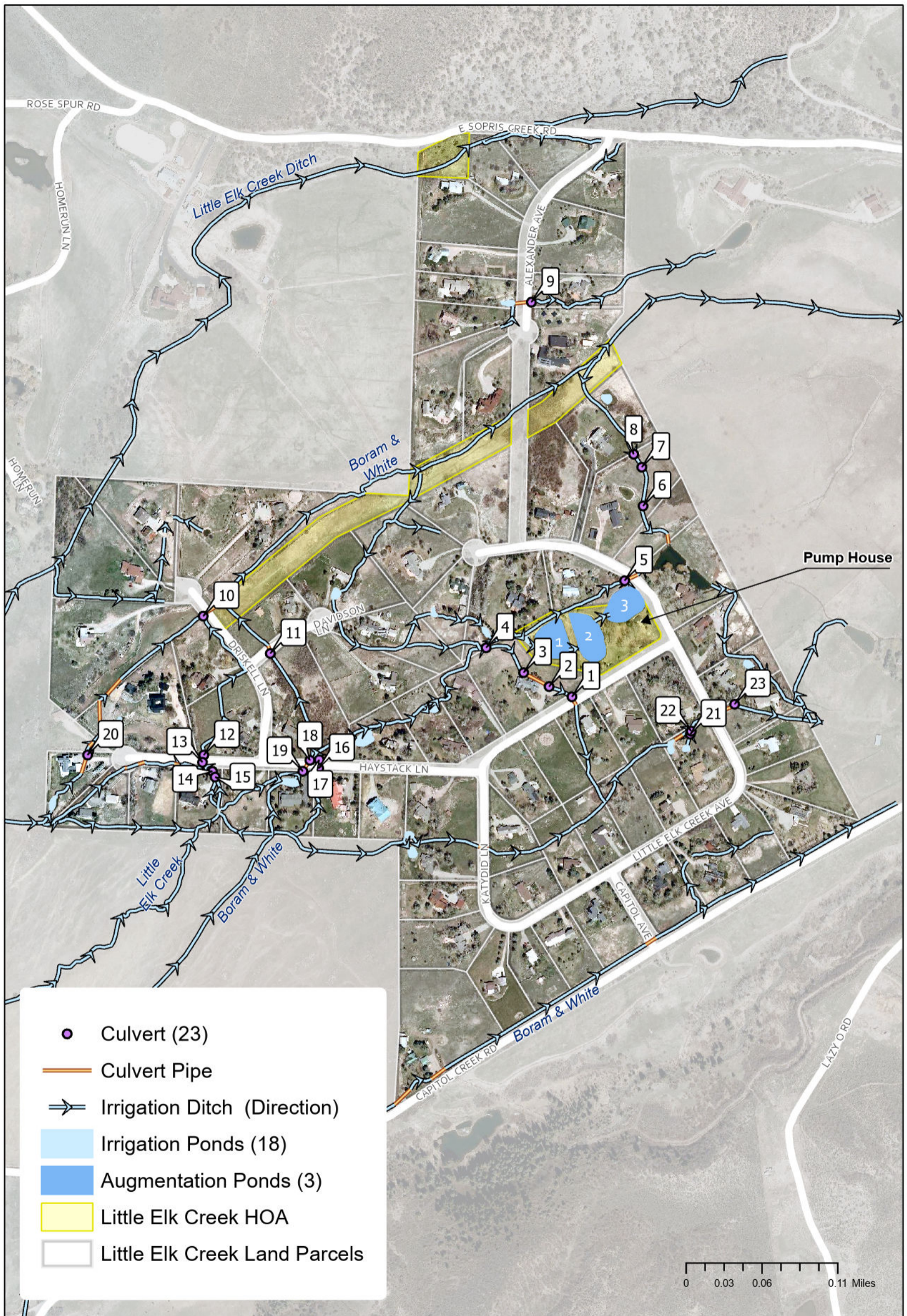


Appendix A - Water Infrastructure Maps
 Fig. 3 - Water Tank Infrastructure

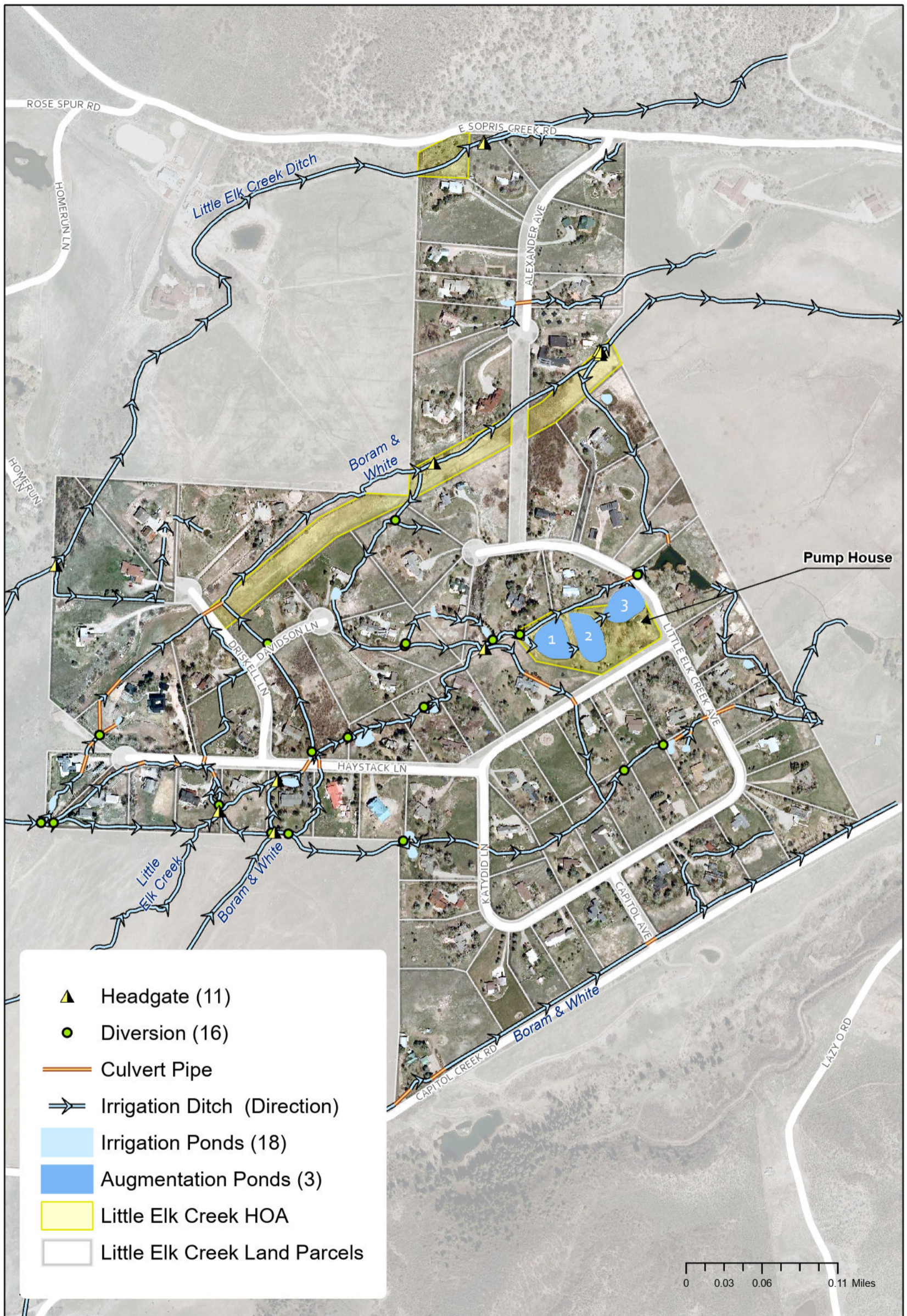


- Check dam (7)
- Culvert Pipe
- ⇒ Irrigation Ditch (Direction)
- Irrigation Ponds (18)
- Augmentation Ponds (3)
- Little Elk Creek HOA
- Little Elk Creek Land Parcels

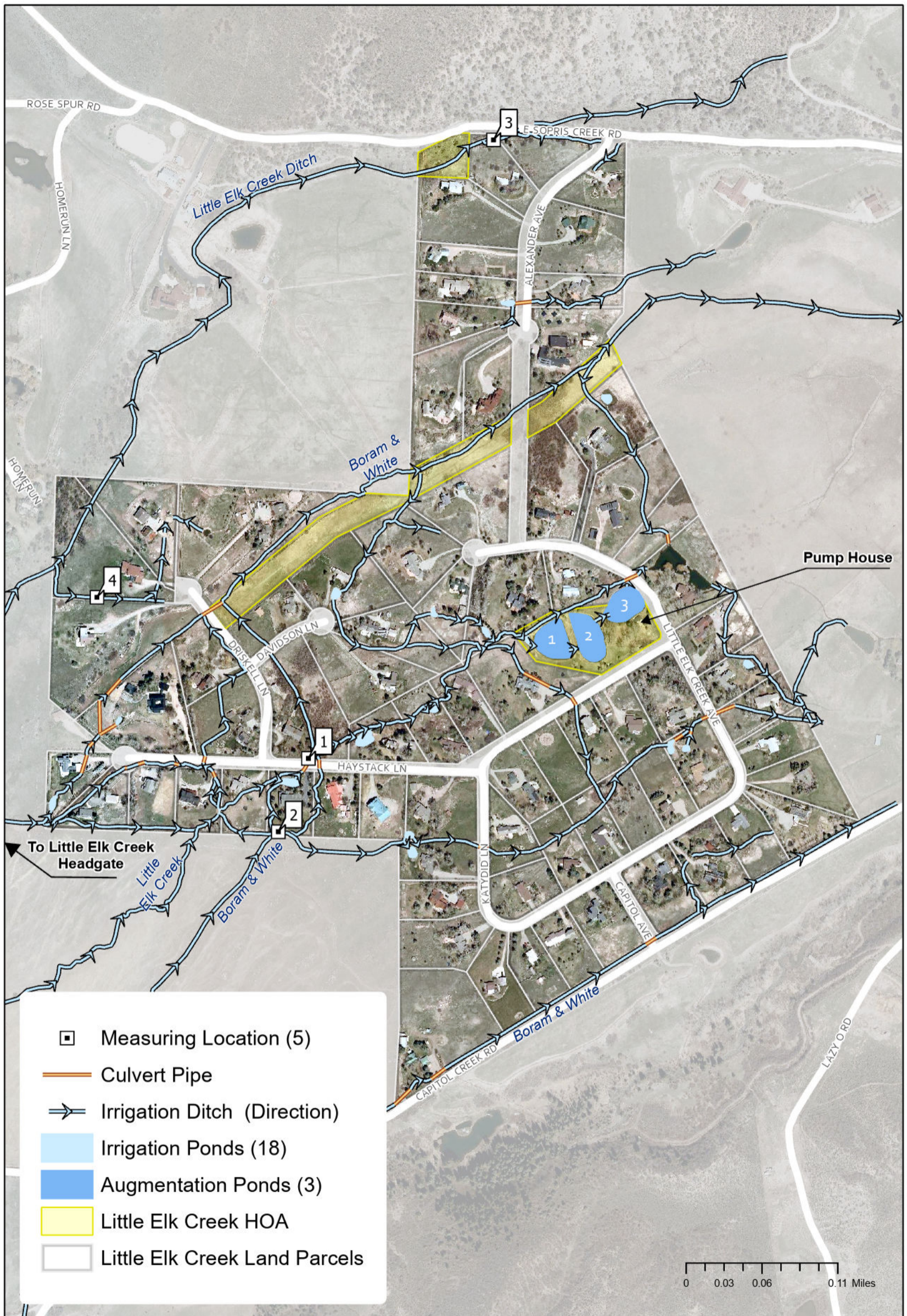
Appendix A - Water Infrastructure Maps
 Fig. 5 - Check Dam Locations Overview



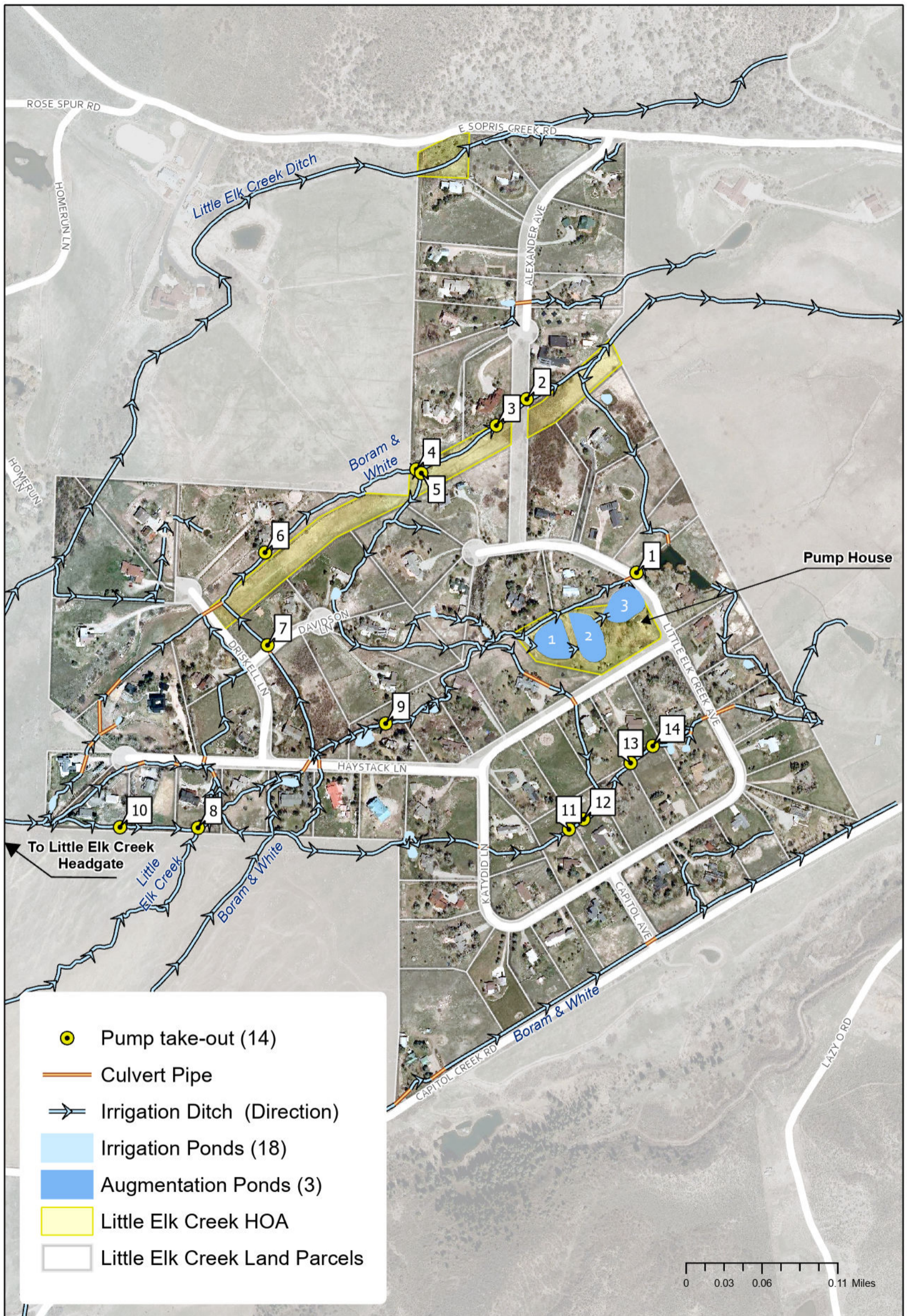
Appendix A - Water Infrastructure Maps
 Fig. 4 - Culvert Locations Overview



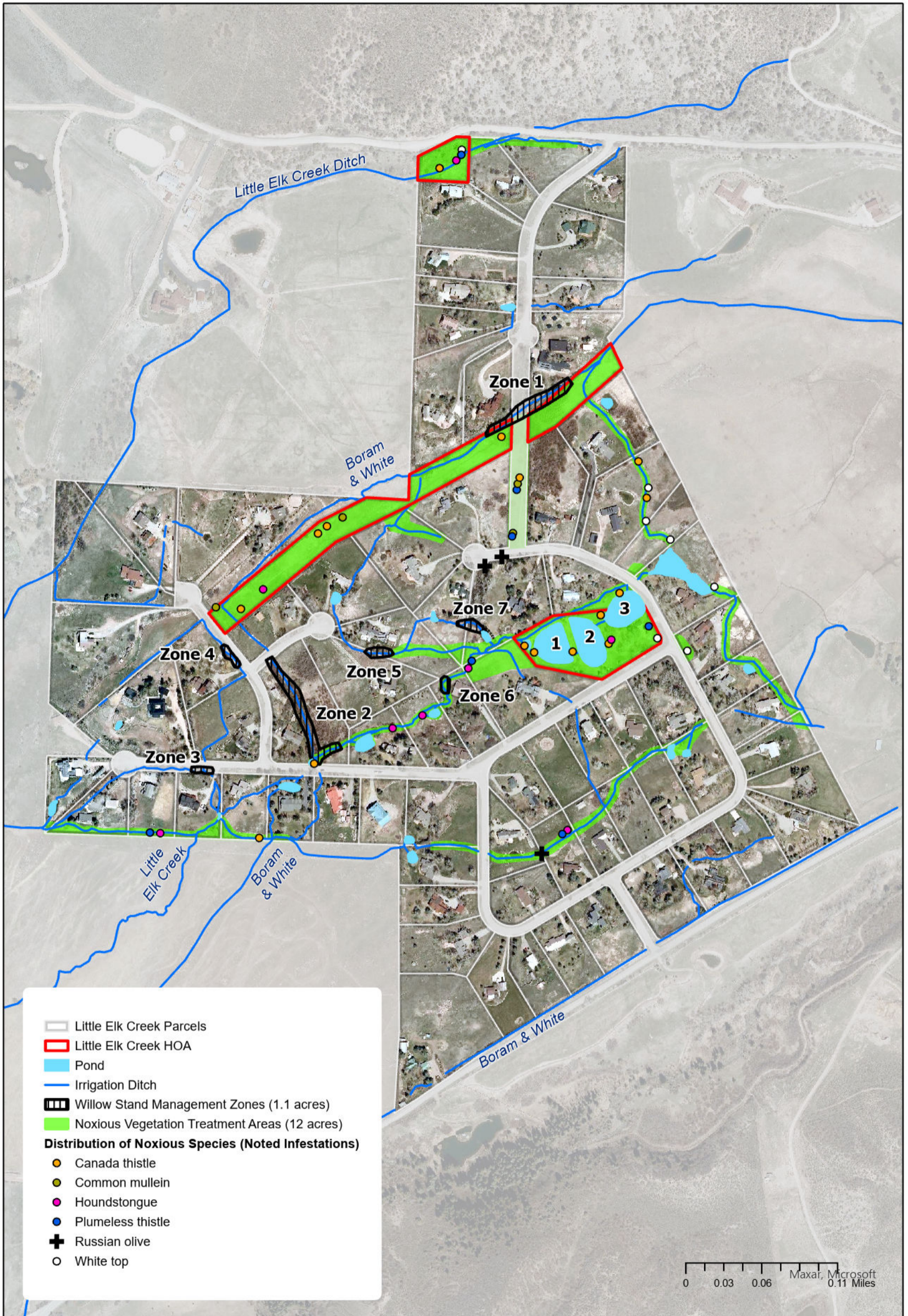
Appendix A - Water Infrastructure Maps
 Fig. 6 - Headgate/Diversion Locations Overview



Appendix A - Water Infrastructure Maps
 Fig. 7 - Measuring Locations Overview

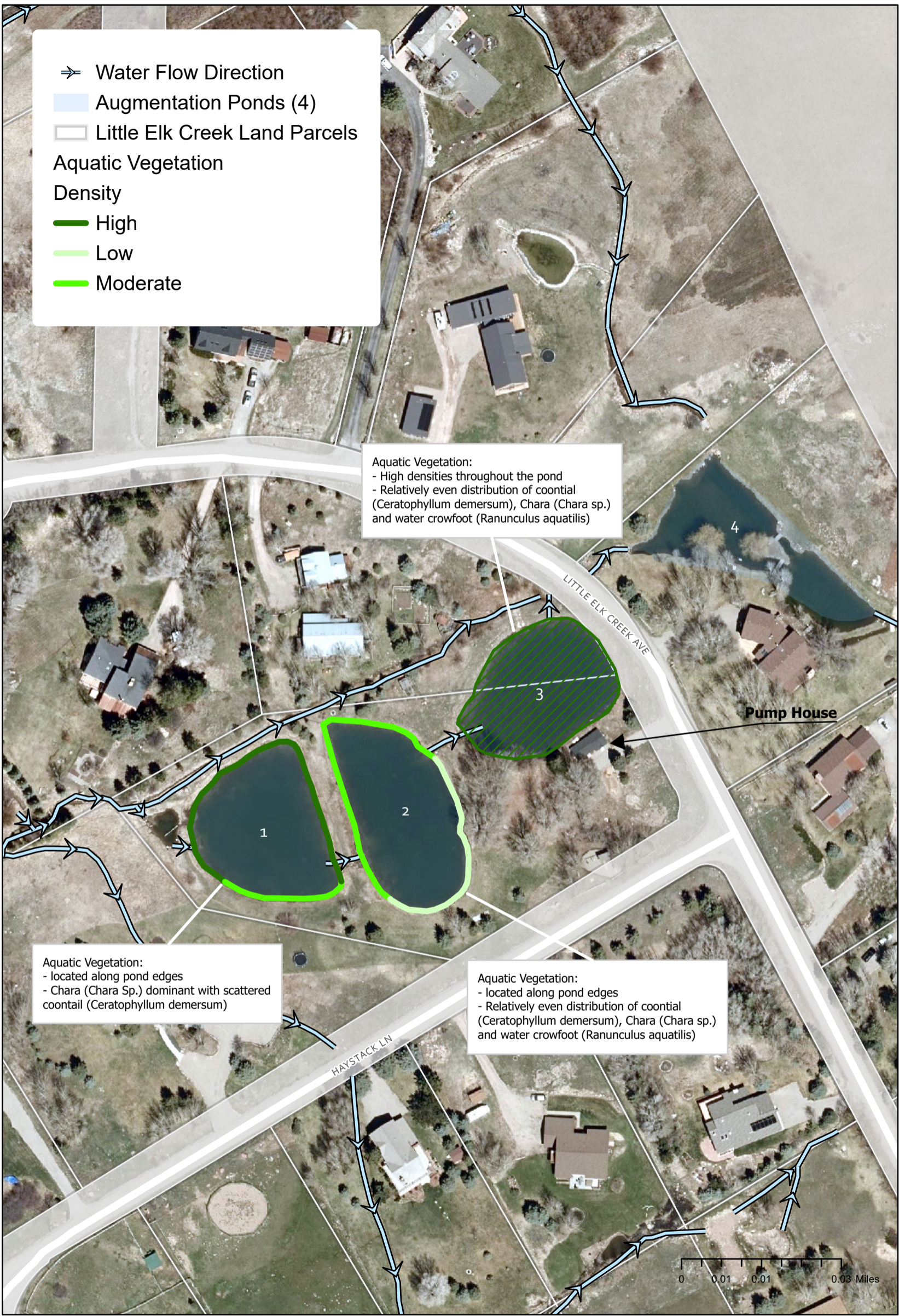


Appendix B - Vegetation and Pond Management Maps



Appendix B - Vegetation and Pond Management Maps

Fig. 1 - Vegetation Management



Appendix B - Vegetation and Pond Management Maps

Fig. 2 - Pond Management

Appendix C - Supporting Documentation

ASPEN OFFICE
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ASPEN, COLORADO 81611

CHEYENNE OFFICE
3228 LOCUST DRIVE
CHEYENNE, WYOMING 82001

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P.O. BOX 1286
GLENWOOD SPRINGS, COLORADO 81601

SAN LUIS VALLEY OFFICE
P.O. BOX 240
ALAMOSA, COLORADO 81101

STEAMBOAT OFFICE
P.O. BOX 5220
STEAMBOAT VILLAGE, COLORADO 80499

WRIGHT WATER ENGINEERS, INC.

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JOHN H. GERSTLE
H. RAY NEWMYER
CATHERINE KRAEGER
EDWARD W. ROYER
MARILYN M. STONE
DAN E. VERWOERT

August 15, 1980

Mr. Randy Cote
Little Elk Creek Association
P.O. Box 453
Snowmass, CO 81054

RE: Water Rights Evaluation
Little Elk Creek Subdivision

Dear Randy:

In accordance with your request, we have documented the findings of our water rights evaluation for the Little Elk Creek Homeowners Association (LECHA) in the following report. The material presented in this report is responsive only to item one of our engineering proposal dated June 6, 1980. We are presenting our conclusions and recommendations at this point in our investigation so that the homeowners may make appropriate decisions that would have a bearing on future work.

The purpose of our investigation has been to identify and evaluate the water rights which are appurtenant to the Little Elk Creek development. As part of this investigation we have reviewed documents pertaining to the subdivision, topographic mapping, aerial photographs, and records kept by the State Engineer's Office. We have also inspected the property and interviewed several people familiar with irrigation practices in the lower Capitol Creek drainage.

The attached figure shows the boundaries of the subdivision and the boundaries of the original Gallun Ranch, as well as the location of ditches which irrigated the Gallun Ranch.

The following observations, conclusions and recommendations have resulted from our study.

WATER RIGHTS APPURTENANT TO GALLUN RANCH

The 150 acres which comprises the Little Elk Creek development was created from the 550 acre Gallun Ranch. The Gallun Ranch was purchased by Joseph Zoline in 1969, and subsequently he sold parts of the ranch. For the purposes of distributing the water rights appurtenant to the Gallun Ranch to buyers, it was determined that 1 acre would receive 1/550ths of the appurtenant water rights. Therefore, when Ingham & Associates purchased 150 acres for creation of the Little Elk Creek subdivision, they were conveyed 150/550ths, or 27% of all water rights appurtenant to the Gallun Ranch.

The warranty deed between Elizabeth Gallun and Joseph Zoline describes the water rights included in their transaction as "the right, title, and interest of Elizabeth Gallun in and to the Williams No. 1 Ditch and the Williams No. 2 Ditch, both taking water out of Capitol Creek, the Little Elk Ditch taking water out of Little Elk Creek and the Boram and White Ditch taking water out of Capitol Creek".

Historically, the Boram and White Ditch, whose headgate is located on the west bank of Capitol Creek about 4000 feet upstream of the Ranch, entered the southwestern part of the ranch and after crossing Little Elk Creek ran across the north part of the ranch along the East Sopris Creek road. The Boram and White Ditch appears to have irrigated fields south of the subdivision belonging to the Maurin family and a significant portion of the original ranch.

The Little Elk Ditch which diverts water out of the west bank of Little Elk Creek about 3000 feet upstream from the subdivision runs along the extreme northwest portion of the ranch. It appears to have the capability of irrigating land adjacent to the ranch and a moderate area within the ranch.

The two Williams Ditches divert from the east bank of Capitol Creek and historically irrigated fields east of Capitol Creek. It is our understanding

that the Williams No. 1 and 2 Ditches were never physically used on the Gallun property, and we feel they should not be considered part of the package of water rights physically appurtenant to the Gallun property.

It is our opinion the Boram and White Ditch and the Little Elk Ditch are physically appurtenant to the Gallun Ranch and represent the only two ditches historically used for irrigation on the Ranch. The Boram and White Ditch and the Little Elk Ditch have the following decreed water rights:

<u>DITCH</u>	<u>COURT PRIORITY NUMBER</u>	<u>AMOUNT (cfs)</u>	<u>ADJUDICATION DATE</u>	<u>APPROPRIATION DATE</u>
Boram & White	9	2.5	05-11-1889	05-05-1881
1st Enlg	57	2.6	05-11-1889	04-10-1883
2nd Enlg	174A	1.0	05-11-1889	05-01-1887
3rd Enlg	421F	10.0	08-25-1936	06-05-1920
Elk Creek	143	.8	05-11-1889	04-25-1886
1st Enlg	207A	2.5	03-18-1904	06-01-1889
2nd Enlg	310	.26	08-25-1936	06-01-1890

HISTORIC USAGE/OWNERSHIP

The value of a water right is related to its historic use. The historic use is generally a measure of the acreage actively irrigated under the ditch and the associated depletion (consumptive use) to the river system resulting from evaporation and transpiration. Credit cannot generally be taken for sub-irrigated land when evaluating the usage of a ditch.

We have estimated that 265 acres of historically irrigated land lie under the Boram and White Ditch. Our determination of the internal usage of the ditch shows the Gallun Ranch having historically irrigated about 210 acres with the balance of 55 acres credited to the Maurin family. In addition to the acreage which is actively irrigated, we have estimated 40 acres of sub-irrigated land lies under the Boram and White Ditch near the eastern part of the ranch. A subsequent breakdown of the 210 acres appurtenant to the Gallun Ranch indicates that about 80 acres were irrigated within the current sub-division boundaries prior to development.

A summary of the historic usage pattern and ownership distribution of the Boram and White Ditch decrees, together with a breakdown of the Gallun Ranch water rights, is presented in Table 1.

It appears that 120 acres were historically irrigated from the Elk Creek Ditch. We estimate 50%, or 60 acres, were within the Gallun Ranch boundary. The other 60 acres were irrigated south and west of the ranch. A breakdown of the 60 acres appurtenant to the Gallun Ranch shows that 38 acres of what is now subdivision property were irrigated prior to development.

A summary of the historic usage pattern and ownership distribution of the Elk Creek Ditch decrees, together with a breakdown of the Gallun Ranch water rights is presented in Table 2.

We believe that both ditches generally received a full supply of water in an average water year. In dry years, while the ditches probably divert less water, the fields still receive nearly a full supply of water.

Diversion records for the Boram and White Ditch maintained by the District 39 Water Commissioner for a 6 year period prior to development indicate a typical irrigation season of just over 100 days from late May to early September. Average diversions of the ditch are 5.43 cfs and 1120 acre-feet seasonally. Records compiled during the 1970's show average daily diversions of 10.8 cfs for a 165 day season.

Records for the Elk Creek Ditch for the period 1975 to 1979 indicate a typical season of early June thru late October. Average diversions are .56 cfs and 176 acre-feet seasonally. Records for the Elk Creek Ditch for the pre-development period were apparently not maintained.

Our study of the diversion records for the two ditches indicates that detailed records were generally not maintained.

TABLE 1
BORAM & WHITE DITCH
HISTORIC IRRIGATED LAND AND DECREE OWNERSHIP

<u>HISTORIC USAGE</u>	<u>GALLUN RANCH</u>	<u>MAURIN</u>	<u>TOTAL</u>
Irrigated land (Ac.)	210	55	265
Ownership by usage (%) ¹	79	21	100
<u>DECREE OWNERSHIP (cfs)</u>			
Original	2.5	--	2.5
1st Enlg	2.6	--	2.6
2nd Enlg	0	1.0	1.0
3rd Enlg	<u>8.3</u>	<u>1.7</u>	<u>10.0</u>
TOTAL	13.4	2.7	16.1
Decree ownership of Ditch (%)	83	17	100

DISTRIBUTION OF GALLUN RANCH OWNERSHIP

<u>HISTORIC USAGE</u>	<u>LITTLE ELK CREEK SUBDIVISION</u>	<u>OTHERS INCL ZOLINE</u>	<u>TOTAL</u>
Irrigated land (Ac.)	80	130	210
Ownership by usage (%) ¹	38	62	100
<u>LEGAL OWNERSHIP OF DECREEED RIGHTS (13.4 cfs)</u>			
Amount (cfs)	3.7	9.7	13.4
Percent	27	73	100

¹ Based on irrigated land usage.

TABLE 2
ELK CREEK DITCH
HISTORIC IRRIGATED LAND AND DECREE OWNERSHIP

<u>HISTORIC USAGE</u>	<u>GALLUN RANCH</u>	<u>MAURIN</u>	<u>TOTAL</u>
Irrigated land (Ac.)	60	60	120
Ownership by usage (%) ¹	50	50	100
 <u>DECREE OWNERSHIP (cfs)</u>			
Original	.8	--	.8
1st Enlg	--	2.5	2.5
2nd Enlg	--	.26	.26
TOTAL	.8	2.76	3.56
 Decree ownership of Ditch (%)	 22	 78	 100

DISTRIBUTION OF GALLUN RANCH OWNERSHIP

<u>HISTORIC USAGE</u>	<u>LITTLE ELK CREEK SUBDIVISION</u>	<u>OTHERS INCL. ZOLINE</u>	<u>TOTAL</u>
Irrigated land (Ac.)	38	22	60
Ownership by usage (%) ¹	63	27	100
 <u>LEGAL OWNERSHIP OF DECREEED RIGHTS (0.8 cfs)</u>			
Amount (cfs)	.22	.58	.8
Percent	27	73	100

¹ Based on irrigated land usage.

HISTORIC CONSUMPTIVE USE

As mentioned before, the value of a water right can be measured by its historic depletion (consumptive use) on the river system. The consumptive use is equal to the amount of water diverted at the headgate less that amount which returns to support the stream flow.

The consumptive use attributable to a specific crop can be calculated utilizing regional climatological data. The Jensen-Haise method, a well accepted procedure for calculating consumptive use values, was employed in this study. Table 3 presents the potential season consumptive use values for hay/pasture grass in the Capitol Creek area together with the total consumptive use figures attributable to the fields historically irrigated in the subdivision.

TABLE 3
CONSUMPTIVE USE - LITTLE ELK CREEK SUBDIVISION

<u>DITCH</u>	<u>IRRIGATED ACREAGE (Ac.)</u>	<u>UNIT C.U. VALUE (Ac-ft/Ac)</u>	<u>TOTAL C.U. (Ac-Ft.)</u>
Boram & White	80	1.44	115
Little Elk	<u>38</u>	<u>1.44</u>	<u>55</u>
Total	118	1.44	170

RELATIVE PRIORITY OF THE WATER RIGHTS

Because of the relative seniority of the ditch decrees, we feel it is reasonable to assume that the original decrees of the 2 ditches and the first enlargement of the Boram & White will not be called out by downstream water rights on Capitol Creek or the Roaring Fork River even in dry periods during the irrigation season.

Based on studies of the Colorado River hydrology, decreed water rights, past usage of the Colorado River and tributaries, it is our opinion that senior rights on the Colorado River below the Shoshone Power Plant will not

call out senior rights in the two ditches appurtenant to the subdivision, even in the driest years.

We believe the land irrigated under the Boram and White Ditch and the Little Elk Ditch have historically received a full supply in both average and dry years.

CONCLUSIONS

Based on our interpretation of the material presented in this report, it is our opinion that the water rights claimed by the L.E.C.H.A. represent a strong basis on which a ditch conveyance irrigation system can be developed for the subdivision. The Boram & White Ditch and the Little Elk Ditch both have adequate physical and "legal" supplies and dependable historic usage. Additionally, we do not expect any legal action will be required as part of the development of the irrigation system.

We believe the subdivision can claim 118 acres of historically irrigated land. We expect that the ultimate irrigable residential landscaping for the subdivision will not exceed 95 acres. This statement is based on average lot size of 1.5 acres for the 76 lots and 1.2 acres of landscaping per lot. Therefore, it appears the subdivision has adequate water rights for the purpose of developing a ditch irrigation system.

RECOMMENDATIONS

Based on our studies and evaluations to date, Wright Water Engineers has the following recommendations:

1. Our evaluations and opinions regarding Little Elk Creek's water rights have been based on documentation and information provided to us by the Little Elk Creek Homeowners. Our review of the factual situation has identified some discrepancies in the ownership pattern. For example, we believe the Homeowners have some interest in the Williams No. 1 and 2 Ditches, however, it appears that these rights were not used on the original Gallun Ranch. From an engineering point of

view, these rights may be of little value to the Homeowners. However, they may have some legal value for other purposes. Also, it is our understanding that Abacus Ranch may claim some interest in the Little Elk Ditch. We recommend that you obtain an opinion from your water counsel regarding the legal status of the water rights we have evaluated.

2. In our opinion, we believe the Homeowners have sufficient senior rights to provide irrigation water to the subdivision. Prior to proceeding with additional studies regarding managing this resource, we recommend that the Homeowners develop a strategy or conceptual plan as to how and where they wish to provide irrigation water within the subdivision.
3. The management of the irrigation water resource will become an internal and external management problem. Since there are other owners and users outside the subdivision, the Homeowners should contact the other owners so that a working relationship can be developed that will permit the subdivision to continue receiving its fair share of water.
4. As with any ditch system, there needs to be some mechanism whereby the irrigation ditches can be properly maintained, both internally and externally. We recommend that you consider developing and adopting some form of rules and regulations to handle ditch maintenance.
5. We understand that the Little Elk Creek Subdivision has experienced some local drainage problems. We suggest that the Homeowners consider creating an organizational structure that will be responsible for irrigation and drainage conjunctively.

Mr. Randy Cote
August 15, 1980

-10-

If appropriate, we will be available to meet with the Homeowners to explain the findings of our investigation. If you have any questions regarding our report, please feel free to contact us.

Very truly yours,

WRIGHT WATER ENGINEERS, INC.

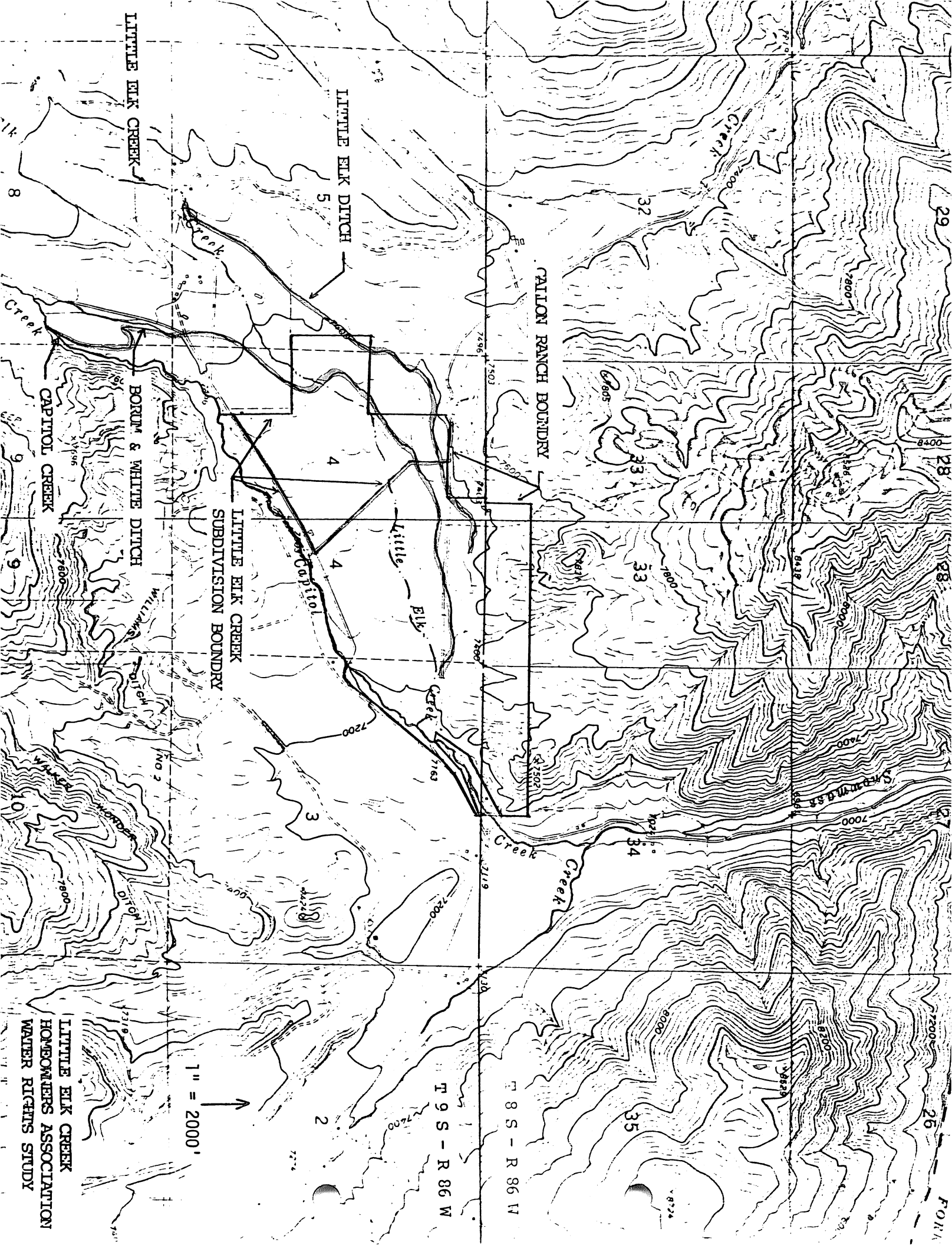
By Walter F. Bricker
Walter F. Bricker

By Richard D. Johnson
Richard D. Johnson

WFB:RDJ:ep

cc: Scott Balcomb

801-057



LITTLE ELK CREEK

LITTLE ELK DITCH

CANYON RANCH BOUNDARY

BORUM & WHITE DITCH

CAPITOL CREEK

LITTLE ELK CREEK
SUBDIVISION BOUNDARY

1" = 2000'

T 9 S - R 86 W

T 8 S - R 86 W

LITTLE ELK CREEK
HOMEOWNERS ASSOCIATION
WATER RIGHTS STUDY



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Professional Corp.

April 5, 2013
Andre Schwegler and Sherri Spykerman
schwegler@sopris.net

Via Email

RE: *Little Elk Creek Village HOA water rights and resources (our file # 1118 A)*

Dear Andre and Sheri:

Per your request and the request of Larry Jones, we have conducted a basic review of the water rights and resources owned by the Little Elk Creek Village Homeowners' Association (the "HOA") and used upon the property described as Block 3 Lot 12, Little Elk Creek Village, Filing 2 (0310 Little Elk Creek Avenue) (the "Property"). We specifically looked at the ownership and sufficiency of these water rights and resources. To complete this analysis, we reviewed relevant provisions of the Little Elk Creek Ditch Company's Articles of Incorporation and notebook ledger, Boram and White Ditch Company assessments, and an engineering study conducted on Little Elk Creek Village's water rights, as well as information from our own files. We also reviewed copies of the relevant water rights decrees, the state's diversion records, and well permit records.

We have *not* engaged in a water rights title review. Similarly, we have also not engaged in an environmental, wetlands, water quality, or sewage disposal audit for the property. Consequently, those issues are not addressed in this letter and *this is not a title opinion.*

Based on our review, we believe the HOA owns the water rights and resources described below and that these rights and resources are sufficient to serve the HOA and the Property.

I. Domestic Water – Well Nos. 1-4:

The Property is located within the Little Elk Creek Subdivision, and thus receives its treated domestic water from the Little Elk Creek Community Water System. A letter from the HOA's Board of Trustees, dated April 3, 2013, attesting to that fact is attached hereto as **Exhibit A.**

The HOA's domestic water is sourced from the following four wells:

- Well No. 1, permitted under Well Permit No. 056888-F;
- Well No. 2, permitted under Well Permit No. 056889-F;
- Well No. 3, permitted under Well Permit No. 056890-F; and
- Well No. 4, permitted under Well Permit No. 056891-F;



Andre Schwegler and Sherri Spykerman
April 5, 2013
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We reviewed the permitting on file with the State Engineer's Office for the wells, and it is compliance with all of the Office's regulations. The permits, which are all issued in the HOA's name, are attached hereto as **Exhibits B-E**. The wells are permitted to each pump at a maximum rate of 60 gallons of water per minute ("g.p.m."), and to produce a combined total of 22 acre-feet of water per year. The Well Construction and Test Reports attached to Permit Nos., 056888-F, 056889-F, and 056891-F show that the wells pump at the considerable sustained pumping rates of 15+, 15+, and 10 g.p.m respectively.

Well Nos. 1-4 are fully augmented by the plan for augmentation decreed to Little Elk Creek Village in Case No. 84CW285, Division 5 Water Court. In simple terms, a plan for augmentation is a court-approved water supply plan that enables a junior water right to continue diverting or a junior or well to continue pumping during water-short periods when that structure would otherwise get curtailed or shut-off to benefit more senior water rights. The plan does this by replacing an amount of water equivalent to the junior depletions back into the stream. The fact that Well Nos. 1-4 are fully augmented means that they can provide the HOA with domestic water on a year-round basis.

In 1984, Little Elk Creek Village commissioned an engineering report from Wright Water Engineers in support of its augmentation plan. The report is attached hereto as **Exhibit F**. Page 5 of the report states that the 22 acre-feet of water per year permitted to the wells and augmented by the plan for augmentation is sufficient to provide domestic water to the Little Elk Creek Village at *total build out* on a year-round basis.

Thus, in light of the well permits, augmentation plan, and engineering report discussed above, we are confident in concluding that the HOA holds title Well Nos. 1-4, and that these wells are sufficient to provide an adequate domestic water supply to the HOA and Property.

II. Irrigation Water

The April 4, 2013 letter from the HOA's Board of Trustees also states that because the Property is located in the Little Elk Creek Subdivision, it can receive irrigation water from the Little Elk Ditch and the Boram and White Ditch.

A. Little Elk Ditch

In 1983, all of the owners of water rights in the Little Elk Ditch incorporated into the Little Elk Creek Ditch Company (the "Ditch Company"). A mutual ditch company is a Colorado non-profit corporate structure under which a group of water rights holders combine their water rights and/or ditch rights concerning a specific ditch. The company then, in turn, issues stock in proportion to each shareholder's original water rights or ditch structure ownership interests. The company also takes over responsibility for administrating, operating, maintaining and repairing



Andre Schwegler and Sherri Spykerman
April 5, 2013
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the ditch, as well as allocating costs amongst and providing insulation from liability for the shareholders.

Priority	Case No.	Adjudication Date	Appropriation Date	Amount (cfs)
143	CA0132	5-11-1889	4-25-1886	0.8
207A	CA1042	3-18-1904	6-1-1889	2.44
310	CA3082	8-25-1936	6-1-1890	0.26
			TOTAL	3.5

Our firm has long represented the Ditch Company. The Ditch Company's corporate notebook, attached hereto as **Exhibit G**, states that the HOA originally held 14,375 out of the 50,000 issued shares in the Company (28.75%). This interest is fairly consistent with the statement on page 2 of the Wright Water Engineers report that:

The 150 acres which comprise the Little Elk Creek development was created from the 550 acre Gallum Ranch, which was purchased in 1969. When the developers of the Little Elk Creek Subdivision purchased the 150 acres, they were apparently conveyed 150/550th, or 27% of all water rights appurtenant to Gallum Ranch. The Boram and White Ditch and the Elk Creek Ditch both irrigated portions of the present subdivisions.

Subsequently, the Company re-issued its stock based on 10,000 shares outstanding. The HOA currently holds 2,875 of the 10,000 shares (28.75%). The HOA's stock certificate no. 3 is attached hereto as **Exhibit L**.

The Ditch Company's Articles of Incorporation reveal that the Company has not divided its stock into multiple classes. This means that it is comingling all three Little Elk Ditch water rights into one pool, and then allocating to each shareholder his or her pro rata share. All three water rights, with Priority 143 in particular, are very senior on Capital Creek and should be satisfied in large extent every year. The State's diversion records confirm that this ditch consistently diverts from May through September in years of average precipitation. In years of high precipitation, water is available through October. In years of extremely low precipitation, water is generally not available past August. The diversion records are attached hereto as **Exhibit H**.

The Articles of Incorporation contemplated the title owners of the Little Elk Ditch water rights (the three decreed priorities totaling 3.5 c.f.s.) would quit claim deed their interests to the Company in exchange for proportionate shares of stock. The Corporate Notebook we have does not have any records of Quit Claim Deeds from the individual stockholders to the Ditch Company. However, my partner, Kevin Patrick, who formed the Ditch Company, recalls that these deeds were obtained. There was a Resolution in 1987 whereby the shareholders agreed to re-convey the water rights back to the individual shareholders. However, we are not aware that this ever occurred. So, to the best of our knowledge and research, title to the water rights remains vested in the Ditch Company (with perhaps an "inchoate" right of each shareholder to require re-conveyance of a proportionate interest in the water rights).



In 1987, the Ditch Company agreed to convey 10% of the water rights to Bo Cote. A deed was executed to this effect. Thus, it appears the Ditch Company holds title to the remaining 90% of the water rights, or 3.15 c.f.s. Each share of stock is equivalent to a proportionate interest in all of the priorities of the water rights. Therefore, one share of stock equals 0.000315 c.f.s.; and the HOA's 2875 shares equates to 0.91 c.f.s., or 26% of the total water rights decreed to the Ditch.

The Little Elk Ditch has a decreed duty of water of 1 cubic foot of water per second ("c.f.s.") for 50 acres. This means that under Colorado law, the ditch can irrigate up to 175 acres. The HOA's 26% interest in the water rights can thus irrigate up to 45.5 acres by decree. The Wright Water Engineers report estimated that in 1983, Little Elk Ditch water irrigated 38 acres within the Little Elk Creek Village.

B. Boram and White Ditch

As discussed above, the Wright Water Engineers report claims Little Elk Creek Village a 27% pro rate interest in the following water rights in the Boram and White Ditch:

Priority	Case No.	Adjudication Date	Appropriation Date	Amount (cfs)
9	CA0132	5-11-1889	5-5-1881	2.5
57	CA0132	5-11-1889	4-10-1883	2.6
174A	CA0132	5-11-1889	5-1-1887	1.0
421F	CA3082	8-25-1936	6-5-1920	10.0
			TOTAL	16.1

This ownership interest is consistent with an August 19, 2008 invoice, attached hereto as **Exhibit I**, billing the Little Elk Subdivision for 27.99% of a debt relating to the ditch. Furthermore, the decree in Case No. 84CW285, Division 5 Water Court, states outright that the Little Elk Creek Village owns 27%, or 4.347 c.f.s. of the water rights listed above. In Case No. 84CW285, Little Elk Creek Village applied to the water court to use a portion of its water rights in the Boram and White Ditch as the source of augmentation water for Well Nos. 1-4 in the plan for augmentation discussed above. Under Colorado law, a party generally must make a basic showing of title before changing a water right (even though ultimately Water Courts do not have jurisdiction to determine title). The decree is attached hereto as **Exhibit J**.

All of the Boram and White Ditch water rights are very senior on Capital Creek and should be satisfied every year. In fact, Priority 9 is the most senior water right on the stream. The State's diversion records confirm that this ditch consistently diverts full amounts of water from May through September in years of average precipitation. In years of high precipitation, water is available through October. In years of extremely low precipitation, water is generally not available past September. The diversion records are attached hereto as **Exhibit K**.

The Boram and White also has a decreed duty of water of 1 c.f.s. for 50 acres. This means that under Colorado law, the ditch can irrigate up to 805 acres. In Case No. 84CW285, Little Elk



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Page 5

Creek Village permanently dedicated 2.647 c.f.s. of its 4.347 c.f.s. in the water right to be used as the source of augmentation water for Well Nos. 1-4. This means that the HOA has 1.7 c.f.s. remaining to use for irrigation purposes (9.9% of the total water decreed to the ditch). The HOA's water can thus irrigate up to 85 acres. The State's diversion records report that in recent years, the ditch has been irrigating between 145 and 171.36 acres. While it is impossible to determine how many of those acres are within the HOA, 9.9% equals between 14.3 and 16.7 acres. The Wright Water Engineers report estimated that in 1983, Boram and White water irrigated 80 acres within the Little Elk Creek Village.

Thus, in sum based on the basic review conducted, we conclude the HOA holds 2,875 shares of stock in the Little Elk Creek Ditch Company. The HOA's stock certificate is attached, we are knowledgeable as to the accuracy of the Ditch Company's notebook. We also conclude the HOA holds interest in 4.347 c.f.s. in the Boram and White Ditch. Again, although we do not have a deed evidencing title, the fact that Little Elk Creek Village involved the water rights in Water Court case and the fact that the Water Judge confirmed these facts in the 84CW285 decree provide strong indicia of title.

Furthermore, we are confident in representing that the Little Elk and Boram and White Ditches provide sufficient irrigation water supply to the HOA and Property. As discussed above, both water rights are very senior on Capital Creek. The State's diversion records demonstrate that these rights provide adequate amounts of water throughout the irrigation season. Additionally, the water rights are decreed to irrigate up to 170 acres – far more acreage than is located within the Little Elk Creek Village Subdivision. The fact that the water rights may currently only be irrigating between 46 and 68 acres aligns with the reality of a 75 home sub-division with houses, driveways, and other developed surfaces. It is our understanding the Property itself has approximately 0.25 acre of irrigated lawns and gardens.

It has been a pleasure assisting you in this matter. Please feel free to contact me or my associate Danielle Van Arsdale with any questions.



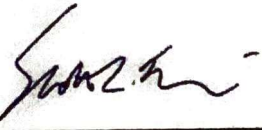
WATERLAW.

PATRICK | MILLER | KROPF | NOTO

Andre Schwegler and Sherri Spykerman
April 5, 2013
Page 6

Very truly yours,

Patrick | Miller | Kropf | Noto
A Professional Corporation

By: 

Scott C. Miller
miller@waterlaw.com

SCM/dlv

201199

AGREEMENT AND DEED OF EASEMENT

BOOK 342 PAGE 57

This AGREEMENT and DEED OF EASEMENT, made this 21st day of June, 1976, by and between ROLLING MEADOWS, INC., a Colorado Corporation (hereinafter called "Rolling Meadows"), and LITTLE ELK CREEK ASSOCIATES, a Colorado Limited Partnership (hereinafter called "Little Elk Creek").

WITNESSETH:

WHEREAS, Rolling Meadows is the owner of a tract of land in Pitkin County, State of Colorado, which is more fully described as follows, to-wit:

A tract of land situated in Section 4, Township 9 South, Range 86 West of the 6th Principal Meridian and in Section 33, Township 8 South, Range 86 West of the 6th Principal Meridian being more particularly described as follows:

Beginning at a point on the north line of Tract 80 in said Section 33 whence AP-3 of said Tract 80 bears N 89°20'00" W 1200.00 feet;
thence S 89°20'00" E 1236.00 feet along said tract line;
thence departing from said tract line South 1393.10 feet to a point on the northerly right-of-way fence of a county road;
thence along said right-of-way fence N 88°26'48" W 305.57 feet; thence continuing along said right-of-way fence N 88°35'17" W 930.74 feet;
thence departing from said fence North 1376.26 feet to the point of beginning, containing 39.279 acres more or less.

WHEREAS, Little Elk Creek desires to obtain a water tank easement affecting the above described property, and water line and/or water tank easements adjoining certain contiguous property.

NOW THEREFORE, for and in consideration of mutual covenants and agreements hereinafter set forth, and for other good and valuable considerations, the receipt and sufficiency of which are hereby acknowledged, the parties hereto hereby agree as follows:

Rolling Meadows does hereby grant and convey to Little Elk Creek, its and their respective successors and assigns, a perpetual right of way and easement to construct, operate, maintain, replace

and remove such domestic water system, consisting of water storage tanks, buried water pipes, underground wires, and other underground appurtenances on, over, under and across the land which the undersigned owns or in which the undersigned has any interest in the following strip of land described in Exhibit "A" attached hereto and incorporated herein.

This grant and conveyance also provides and includes the following rights for Little Elk Creek; of ingress and egress over, along and across the land owned by the undersigned to and from the above described strip of land for the purpose of exercising all rights herein granted, provided that such rights of ingress and egress shall not unreasonably interfere with the use of said land owned by Rolling Meadows, its successors and assigns.

The undersigned grantor, its and their respective successors and assigns, shall have the following rights which are hereby reserved: to use the surface area of the easement and the property upon which the easement is located, such use to include the placement of fences, provided, however, that no such use will materially interfere with or damage the domestic water system or property of Little Elk Creek installed pursuant to this agreement, or with the maintenance, repair and replacement of said water system and property:

IN FURTHER CONSIDERATION, Little Elk Creek grants unto Rolling Meadows, its and their respective successors and assigns, a perpetual right to tap into the water system constructed by Little Elk Creek at any point along the easement granted, providing the use will be for domestic purposes only, limited to one single family residence. If Little Elk Creek, or its successors or assigns shall impose a charge for the use of water upon all of the users of water from said system, then Rolling Meadows, its and their respective successors and assigns shall pay for the water used by them at the same rate or rates charged to all such other users on a uniform basis.

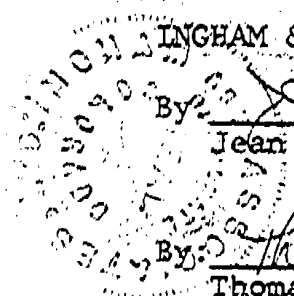
Little Elk Creek further agrees that after construction of its facility in the right of way it will at its expense promptly restore the land as nearly as possible to its condition existing prior to commencement of constructions, and thereafter it will maintain the same in such condition. In particular, Little Elk Creek shall use its best efforts to prevent erosion of said land and take such remedial steps as may be necessary to restore any land erosion which may have occurred.

IN WITNESS WHEREOF, Rolling Meadows, Inc., and Little Elk Creek Associates have hereunto set their respective hands and seals the day and year first above written.

LITTLE ELK CREEK ASSOCIATES
A Colorado Limited Partnership
by Ingham & Associates, Ltd.,
General Partner.

ROLLING MEADOWS, INC.

By *Earl J. Hansen*
President



INGHAM & ASSOCIATES, LTD.

By *Jean C. Ingham*
Jean C. Ingham, President

By *Jamie K. Zoline*
Secretary

By *Thomas R. Dickerson*
Thomas R. Dickerson, Secretary

EXHIBIT "A"Water Tank Easement Description

A water tank easement situate in Tract 80, Section 33, Township 8 South, Range 86 West of the 6th Principal Meridian being more particularly described as follows:

Beginning at the point whence the NE corner of Section 4, Township 9 South, Range 86 West of the 6th Principal Meridian bears S 68°24'53" E 1643.65 feet, with all bearings contained herein relative to record bearings of Little Elk Creek Village Subdivision, Blocks 2 and 3; thence N 04°27'10" W 50.00 feet; thence S 85°32'50" W 50.00 feet; thence S 04°27'10" E 50.00 feet; thence N 85°32'50" E 50.00 feet to the point of beginning.

Water Line Easement Description

A water line easement situate in Section 4, Township 9 South, Range 86 West, and Section 33, Township 8 South, Range 86 West, all of the 6th Principal Meridian, being 20 feet in width and lying 10 feet on each side of the following described centerline:

Beginning at a point on the easterly boundary line of Little Elk Creek Village Subdivision, Block 3, whence the Northeast corner of Lot 1 of said subdivision bears North 22.09 feet, also whence the Northeast corner of said Section 4 bears N 79°48'00" E 3526.58 feet, with all bearings contained herein relative to record bearings of said Little Elk Creek Village Subdivision, Blocks 2 and 3; thence S 88°48'14" E 385.37 feet; thence S 70°55'20" E 59.15 feet; thence N 89°51'51" E 55.46 feet; thence N 71°47'54" E 101.70 feet; thence S 87°27'51" E 176.53 feet; thence N 07°33'48" E 228.17 feet; thence N 22°46'23" E 262.15 feet; thence N 35°08'45" E 35.58 feet; thence N 52°22'40" E 41.14 feet; thence N 57°39'13" E 324.03 feet; thence N 63°59'44" E 201.75 feet; thence S 83°48'06" E 97.83 feet; thence N 84°05'34" E 126.60 feet; thence N 88°33'54" E 160.86 feet; thence N 03°52'17" E 196.76 feet; thence N 17°21'17" E 141.80 feet; thence N 31°29'13" E 104.24 feet; thence N 21°47'34" E 35.57 feet. The sidelines of the above described easement being lengthened or shortened on the westerly end to terminate on said easterly boundary line of Little Elk Creek Village Subdivision, Block 3.

All being situate in the County of Pitkin, State of Colorado.

BOOK 527 PAGE 230

EASEMENT AGREEMENT

Dec 31 9 43 PM '86

LORETTA BANNER
PITKIN CTY. RECORDER

284904

THIS AGREEMENT made this 16th day of December, 1986, by and between ANN MILLIGAN GRAY (hereinafter the "Owner") and THE LITTLE ELK CREEK VILLAGE HOMEOWNERS' ASSOCIATION (hereinafter the "Association").

W I T N E S S E T H

WHEREAS, ANN MILLIGAN GRAY is the owner of certain real property known as Lot 9, Block 3, Little Elk Creek Village Subdivision, Filing No. 2, County of Pitkin, State of Colorado, hereinafter referred to as the Property, and

WHEREAS, the Association is desirous of implementing its water augmentation plan; and

WHEREAS, a portion of said plan contemplates the construction of holding ponds which in part may be upon the Owner's real property described above; and

WHEREAS, the parties by this agreement wish to make provisions for an easement for the aforementioned holding ponds, which the Owner acknowledges is being constructed partially for her benefit.

NOW, THEREFORE, for Ten Dollars (\$10.00) and other good and valuable consideration, each in hand paid to the other and in consideration of the mutual covenants and easements herein contained, it is agreed as follows:

18-31-86

1. Easement. The Owner grants to the Association a non-exclusive easement twelve thousand two hundred (12,200) square feet of the Property, as defined in Exhibit A attached hereto and incorporated herein by this reference, in order to accommodate the aforementioned holding ponds, and any equipment necessary for the maintenance and operation of the holding ponds, and for any landscaping associated with said holding ponds. The location of said easement is shown on Exhibit B attached hereto and incorporated herein by this reference.

2. Obstruction. The Owner hereto agrees not to obstruct, impede, or interfere, in the reasonable use of the holding ponds for the purposes herein described.

3. Maintenance. The Association shall be responsible for the cost of the construction and maintenance of the holding ponds, and by its acceptance hereof agrees to maintain the ponds in all respects.

4. Indemnification. The Association agrees, jointly and severally, to indemnify, defend and hold Owner harmless from and against all liabilities, losses, claims, damages, actions, suits, or other charges arising out of the granting of this Easement or in connection with construction, maintenance or use of the holding pond to be constructed on the Easement, or on account of injury to any third person in or around the holding ponds including without limitation, all expenses, disbursements, advances, and reasonable attorneys' fees. The Association agrees to maintain public liability insurance in the amount of at least

92-10-81

One Million Dollars (\$1,000,000.00) with terms and in companies reasonably satisfactory to Owner which insurance shall name the Owner as an additional insured. The Association shall provide the Owner with a certificate from its insurance carrier listing the coverage to this extent and designating the Owner as a named insured. In addition, said policy shall provide that it may not be canceled or amended without ten (10) days prior written notice to the Owner.

5. No Interference. The exercise of the rights granted herein by either party shall not unreasonably interfere with the use of the properties burdened hereby.

6. Construction. The rule of strict construction does not apply to this grant. This grant shall be given a reasonable construction so that the intention of the parties to confer a mutually usable right of enjoyment on each other is carried out.

7. Notices. All notices, demands and communications required hereunder shall be served or given to the respective party at its respective address as set forth below. Any notice, demand or communication shall be given by personal service, or certified mail, return receipt requested with first class postage pre-paid thereon, and unless sooner, received three (3) days after the date of certification. The addresses of the parties hereto are as follows:

Little Elk Creek Village Homeowners' Association
Post Office Box 420
Snowmass, Colorado 81654

Ann Milligan Gray
1416 North Astor
Chicago, IL 60614

18-31-86
98-18-81

8. Assignment. This Agreement shall not be assignable in whole or in part, by the Association without the written consent of the other party, which consent shall not be arbitrarily withheld. The Owner may assign its rights hereunder without the consent of the Association.

9. Attorneys' Fees. Should the Owner be required to resort to legal or equitable process for the enforcement of any of the provisions of this Agreement, she shall be entitled to collect from the Association all of her reasonable attorneys' fees, expenses and costs. In the event the Association shall fail to perform any obligation which Association is required to perform under any provision of this Agreement with reasonable dispatch after notice in writing from Owner, Owner may, but without any obligation on her part to do so, perform such obligation at the sole expense of Association and Association shall reimburse Owner therefor upon demand.

10. Running of Benefits and Burdens. All provisions of this instrument, including the benefits and burdens, run with the land, and except as provided in Paragraph 8 hereof, are binding upon and endure to the assigns and successors of the parties hereto.

18-31-86

EXHIBIT A TO EASEMENT AGREEMENT

A parcel of land being a portion of Lot 9, Block 2, Little Elk Creek Village Subdivision, Pitkin County, Colorado, described as follows:

Beginning at the Southeast corner of Lot 9, Block 2, Little Elk Creek Village;

Thence Northwesterly along a curve to the left a distance of 119.80 feet, whose radius is 230.00 feet;

Thence S64°40' West 83.00 feet;

Thence S51°20' West 40.00 feet;

Thence S39°50' East 22.00 feet;

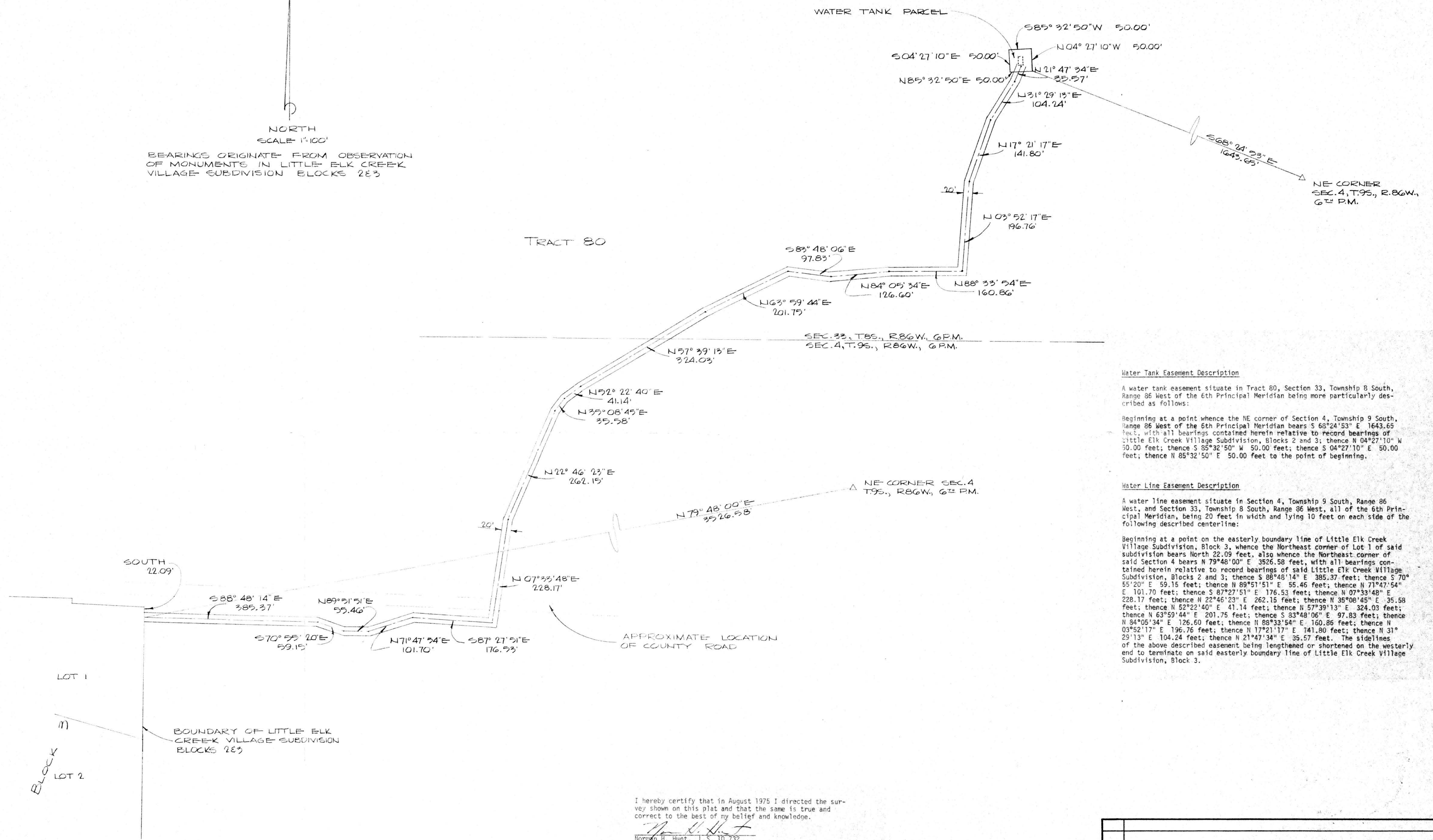
Thence S20°41' West 33.40 feet to the Southerly line of said Lot 9;

Thence N82°5'07" East 187.21 feet along the Southerly line of Lot 9 to the point of beginning containing 0.2801 acres more or less.

County of Pitkin, State of Colorado

12-31-86

NORTH
SCALE 1"=100'
BEARINGS ORIGINATE FROM OBSERVATION
OF MONUMENTS IN LITTLE ELK CREEK
VILLAGE SUBDIVISION BLOCKS 2&3



Water Tank Easement Description

A water tank easement situate in Tract 80, Section 33, Township 8 South, Range 86 West of the 6th Principal Meridian being more particularly described as follows:

Beginning at a point whence the NE corner of Section 4, Township 9 South, Range 86 West of the 6th Principal Meridian bears S 68°24'53" E 1643.65 feet, with all bearings contained herein relative to record bearings of Little Elk Creek Village Subdivision, Blocks 2 and 3; thence N 04°27'10" E 50.00 feet; thence S 85°32'50" W 50.00 feet; thence S 04°27'10" E 50.00 feet; thence N 85°32'50" E 50.00 feet to the point of beginning.

Water Line Easement Description

A water line easement situate in Section 4, Township 9 South, Range 86 West, and Section 33, Township 8 South, Range 86 West, all of the 6th Principal Meridian, being 20 feet in width and lying 10 feet on each side of the following described centerline:

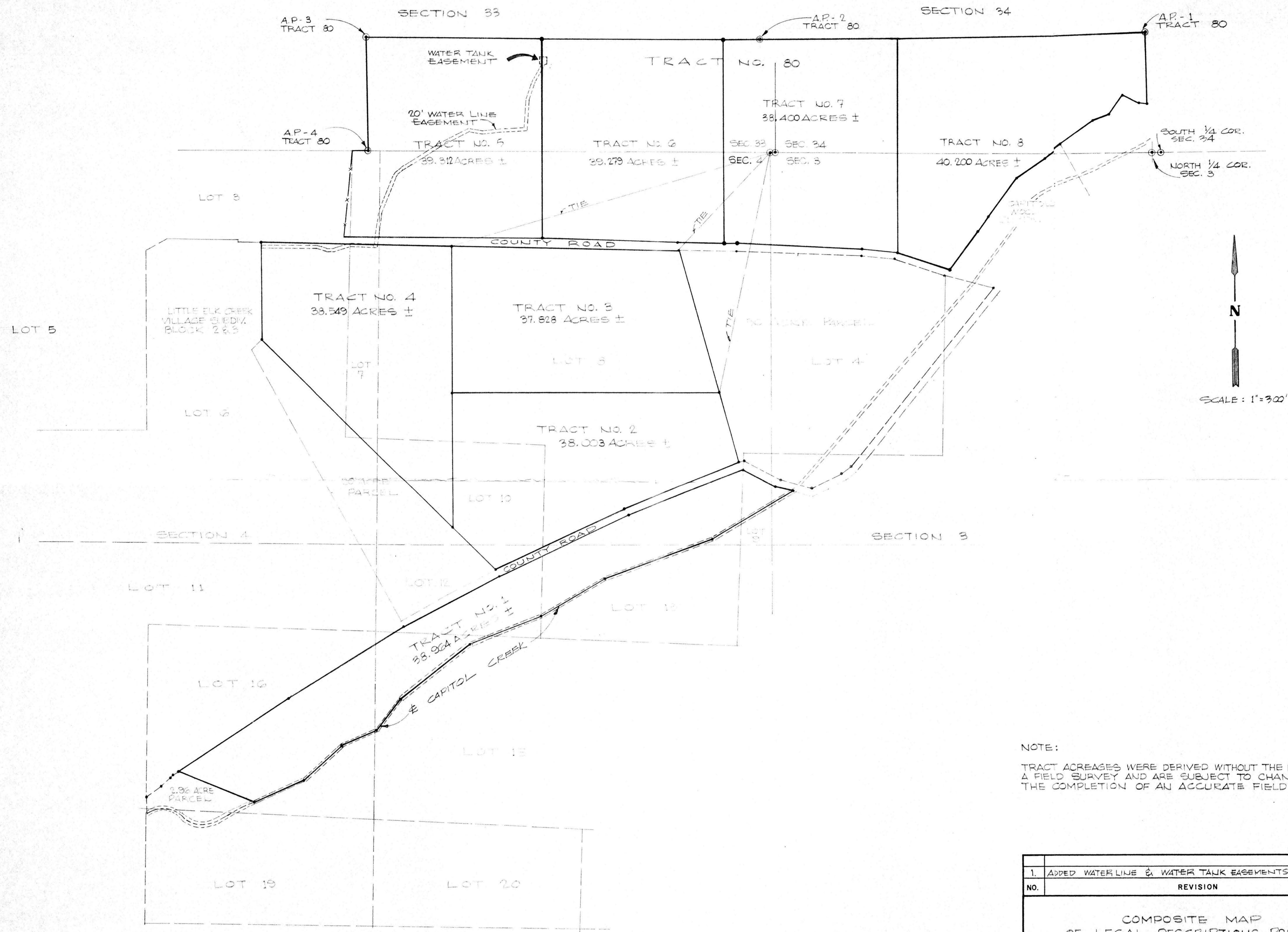
Beginning at a point on the easterly boundary line of Little Elk Creek Village Subdivision, Block 3, whence the Northeast corner of Lot 1 of said subdivision bears North 22.09 feet, also whence the Northeast corner of said Section 4 bears N 79°48'00" E 3526.58 feet, with all bearings contained herein relative to record bearings of said Little Elk Creek Village Subdivision, Blocks 2 and 3; thence S 88°48'14" E 385.37 feet; thence S 70° 55'20" E 59.15 feet; thence N 89°51'51" E 55.46 feet; thence N 71°47'54" E 101.70 feet; thence S 87°27'51" E 176.53 feet; thence N 07°33'48" E 228.17 feet; thence N 22°46'23" E 262.15 feet; thence N 35°08'45" E 35.58 feet; thence N 52°22'40" E 41.14 feet; thence N 57°39'13" E 324.03 feet; thence N 63°59'44" E 201.75 feet; thence S 33°48'06" E 97.83 feet; thence N 84°05'34" E 126.60 feet; thence N 88°33'54" E 160.86 feet; thence N 03°52'17" E 196.76 feet; thence N 17°21'17" E 141.80 feet; thence N 31° 29'13" E 104.24 feet; thence N 21°47'34" E 35.57 feet. The sidelines of the above described easement being lengthened or shortened on the westerly end to terminate on said easterly boundary line of Little Elk Creek Village Subdivision, Block 3.

I hereby certify that in August 1975 I directed the survey shown on this plat and that the same is true and correct to the best of my belief and knowledge.

Norman H. Hunt
Norman H. Hunt, L.S. 10,732



NO.	REVISION	DATE	BY
AS BUILT SURVEY OF LITTLE ELK CREEK VILLAGE SUBDIVISION WATER MAIN & STORAGE TANK ON ZOLINE PROPERTY			JOB NO. 72083 DRAWN: K.W. APPR. N.H.H. SCALE 1"=100' DATE 4 SEP 75 SHEET NO. 1
ELDORADO ENGINEERING COMPANY CONSULTING ENGINEERS - REGISTERED LAND SURVEYORS P.O. BOX 669 GLENWOOD SPRINGS, COLORADO 81601 TELEPHONE 1-303-945-8596			



NOTE:
TRACT ACREAGES WERE DERIVED WITHOUT THE BENEFIT OF A FIELD SURVEY AND ARE SUBJECT TO CHANGE UPON THE COMPLETION OF AN ACCURATE FIELD SURVEY

1.	ADDED WATERLINE & WATER TANK EASEMENTS	11/19/75	A.O.P.
NO.	REVISION	DATE	BY
COMPOSITE MAP OF LEGAL DESCRIPTIONS PREPARED FOR MR. JOSEPH ZOLINE IN OCTOBER 1974		JOB NO. 74152	
		DRAWN: AOP	
		APPR. NHH.	
		SCALE 1" = 300'	
		DATE 29 Oct 74	
ELDORADO ENGINEERING COMPANY CONSULTING ENGINEERS - REGISTERED LAND SURVEYORS P.O. BOX 669 GLENWOOD SPRINGS, COLORADO 81601 TELEPHONE 1-303-945-8596		SHEET NO. 1	OF 1

Appendix D - Photo Documentation



Well 1



Well 2



Well 3



Well 4



Pump House - View from the south of the front of the pump house with two entry doors.



Pump House - View from the east.



Check Dam 1 - Informal water drop structure/check dam to create pool for pump take-out. Stacked rocks used to control water flow.

Check Dam 2 - Check dam for pump take out. Constructed of wooden boards, sand bags and T-posts to control water flow. Wooden bridge to access.

Check Dam 3 - Check dam for pump take out. Constructed of stacked rocks and tarp to control water flow.

Check Dam 4 - Check dam to maintain water levels for lateral diversions. Approximately 7' across, constructed of rocks with a fence post with tarp draped over to control water levels.



Check Dam 5 - Check dam for pump take out. Approximately 4' across, constructed of metal stakes and boards and tarp to control water levels.

Check Dam 6 - Informal water drop structure/check dam to create pool for pipe intake. Constructed of stacked rocks to control water levels.

Check Dam 7 - Concrete water control structure with check dam to maintain water heights for pump take out.



Culvert 1 - 12" culvert, directing lateral under Haystack Lane.



Culvert 2 - 12" culvert, directing water under portion of property landscaping.



Culvert 3 - 12" culvert, directing water under portion of property landscaping.



Culvert 4 - 12" culvert at diverting water point of ditch split.



Culvert 5 - 9" PVC culvert, directing water underneath Little Elk Creek.



Culvert 6 - 32" culvert for ditch crossing.



Culvert 7 - 32" culvert for ditch crossing.



Culvert 8 - 32" culvert for ditch crossing.



Culvert 9 - 12" culvert directing water under Alexander Ave.



Culvert 10 - 24" Culvert directing water under Driskell Lane.



Culvert 11 - Two 24" culverts directing water under Davidson Lane.



Culvert 12 - Culvert directing water under Haystack Lane (Outflow).



Culvert 13 - Culvert directing water under Haystack Lane (Inflow).



Culvert 14 - 12" culvert directing water under residence driveway (Outflow).



Culvert 15 - 12" culvert with wing-walls directing water under residence driveway (Inflow).



Culvert 16 - 22" culvert with metal grate directing water under Haystack Lane (inflow).



Culvert 17 - 22" culvert directing water under Haystack Lane (Outflow). Limited access due to willows.



Culvert 18 - 34" culvert directing water under Haystack Lane (Outflow).



Culvert 19 - 34" culvert with metal grate directing water under Haystack Lane (Inflow).



Culvert 20 - 16" culvert directing water under residence driveway.



Culvert 21 - 8" culvert in field/side yard for access (Inflow).



Culvert 22 - 8" culvert in field/side yard for access (Outflow).



Culvert 23 - 12" culvert directing water underneath Little Elk Creek Ave and through large portion of landscaping.



Diversion 1 - 18" culvert with concrete diversion structure with two-way gate.



Diversion 2 - Concrete diversion / gate - not working, water flow subverting structure on both sides. Channel measured to be 4', structure is 3'



Diversion 3 - Diversion / gate - small concrete structure with wood boards.



Diversion 4 - Concrete diversion box with gate, 4.5'W x 6.5'L.



Diversion 5 - Informal turnout with rocks.



Diversion 6 - Concrete diversion box with two gates. Structure 2'W x 4'L with 10" diversion pipes. Diverts water to upper pond.



Diversion 7 - Old diversion box constructed of wood material with no gates. In poor condition, likely not functional.



Diversion 8 - Wood boards with concrete foundation and pipe diverting water to smaller ponds. No structure to main ditch/pond.



Diversion 9 - Diversion outlet, 10" pipe.



Diversion 10 - No formal structure, just wood boards to divert water.



Diversion 11 - Diversion to pond using sand bags and tarp.



Diversion 12 - No structure, diverts through small 4" pipe.



Diversion 13 - Three-way diversion. Concrete structure with 2' opening and boards to control water levels diverting to the west.



Diversion 14 - Metal diversion box structure with three 12" gates. Two divert Little Elk Creek with one relief inlet from field.



Diversion 15 - Small metal gate diverting water to the northeast through resident landscaping.



Diversion 16 - Concrete diversion box with two gates with 12" outlets. Structure 3' x 2.5'.



Diversion 17 - Concrete and metal diversion structure with three gates. Two gates divert water to the ponds to the north and south.



Diversion 18 - Rock dam diversion point.



Diversion 19 - Concrete diversion structure with three 1' gates/outlets.



Headgate 1 - Culvert with gate feature.



Headgate 2 - Ditch turnout/headgate with 18" outlet.



Headgate 3 - Ditch turnout/headgate with concrete box cover. 18" outlet.



Headgate 4 - Headgate/culvert with 28" corrugated steel culvert.



Headgate 5 - Drop feature



Headgate 6 - Headgate to pond inlet.



Headgate 7 - Headgate with 15" outlet.



Headgate 8 - Headgate with 26" outlet. Corrugated steel culvert 10' long.



Measuring Location 1 - Measuring stick, need more formal measuring device.



Measuring Location 2 - Measuring stick; good location for flume



Pump take-out 1



Pump take-out 2



Pump take-out 3



Pump take-out 4



Pump take-out 5



Pump take-out 6



Pump take-out 7



Pump take-out 8



Pump take-out 9



Pump take-out 10



Pump take-out 11



Pump take-out 12



Pump take-out 13



Pump take-out 14



Photo 1 - Upper Pond - High density aquatic vegetation comprised of *Chara sp.* along eastern pond edge.



Photo 2 - Upper Pond - Moderate density aquatic vegetation comprised of *Chara sp.* along southern pond edge.



Photo 3 - Middle Pond - Low density aquatic vegetation comprised of scattered *Chara sp.* and coontail (*Ceratophyllum demersum*) along southeastern pond edge.



Photo 4 - Middle Pond - Moderate density aquatic vegetation comprised of *Chara sp.*, coontail (*Ceratophyllum demersum*), and water crowfoot (*Ranunculus aquatilis*) along northwestern pond edge.



Photo 5 - Lower Pond - Overview of lower pond with high densities of aquatic vegetation throughout. Comprised of *Chara sp.*, coontail (*Ceratophyllum demersum*), and water crowfoot (*Ranunculus aquatilis*).



Photo 6 - Lower Pond - High densities of aquatic vegetation throughout. Comprised of *Chara sp.*, coontail (*Ceratophyllum demersum*), and water crowfoot (*Ranunculus aquatilis*). View along northern edge.



Photo 7 - Lower Pond - Cattail vegetation along the eastern portions of the pond edge. Currently not an issue with water depths regulating cattail populations, but if increased sedimentation and lower water levels cattails could become an issue.



Photo 8 - Upper Catchment Pond - Murky water with low visibility, no aquatic vegetation noted but significant sedimentation buildup from 6-10 inches.



Photo 1 - Large stand of Russian olive located at the end of Little Elk Creek Ave.

Photo 2 - High density plumeless thistle located in open meadow along trail off of Little Elk Creek Ave.

Photo 3 - High density houndstongue located in disturbance area along irrigation ditch.

Photo 4 - High density Canada thistle located in open meadow along the trail through the HOA open space parcel.



Photo 5 - Small patches of high density white top located along Little Elk Creek Ave. across from the pond open space parcels.

Photo 6 - High density common mullein located in open meadow along the trail through the HOA open space parcel.

Photo 7 - Houndstongue and Canada thistle located along irrigation ditch.

Photo 8 - High density plumeless thistle and houndstongue located along the banks of irrigation ditch.