



Waters Edge Modification of Standards Request

Requested Modifications of Standards for:

3.8.26 Residential Buffering

Specifically requesting modifications for the following:

- (1) exception to allow for public ROW and streets within the buffer yard
- (2) Reduce buffer yard minimum requirement from 350 feet to 150 feet
- (3) Reduce buffer yard plant material requirements
- (4) Eliminate buffer yard plant material requirements in cases of wells being abandoned

Standards

3.8.26 Residential Buffering

(B) The purpose of this Section is to provide standards to separate residential land uses from existing industrial uses, in order to eliminate or minimize potential nuisances such as dirt, litter, noise, glare of lights and unsightly buildings or parking areas, or to provide spacing to reduce adverse impacts of noise, odor or danger from fires or explosions.

(C) Buffer standards. Buffer yards shall be located on the outer perimeter of a lot or parcel and may be required along all property lines for buffering purposes and shall meet the standards as provided in this Section.

(1) Only those structures used for buffering and/or screening purposes shall be located within a buffer yard. The buffer yard shall not include any paved area, except for pedestrian sidewalks or paths or vehicular access drives which may intersect the buffer yard at a point which is perpendicular to the buffer yard and which shall be the minimum width necessary to provide vehicular or pedestrian access. Fencing and/or walls used for buffer yard purposes shall be solid, with at least seventy-five (75) percent opacity.

(2) There are four (4) types of buffer yards which are established according to land use intensity as described in Chart 1 below. Buffer yard distances are established in Chart 2 below and specify deciduous or coniferous plants required per one hundred (100) linear feet along the affected property line, on an average basis.

(4) Additional Standards Applicable to Buffer Yard D. The following requirements shall also apply to development located in Buffer Yard D:

(a) Measured. For purposes of Buffer Yard D standards, the buffer yard shall be measured as the distance from the outer edge of an existing oil and gas operation site to the nearest wall or corner of any occupied building proposed in the residential development. The term existing oil and gas operation site shall include the impact area of any well that has received all required permits prior to submission of the residential development plan, even if drilling has yet to occur on the site. Buffer Yard D areas may include paved areas, notwithstanding paragraph (1) above.

(b) Disclosure. If any residential development is proposed to be located within one thousand (1,000) feet of an existing oil and gas operation, then at such time as the property to be developed is platted or replatted, the plat shall show the one-thousand-foot radius from such well and shall contain a note informing subsequent property owners that certain lots shown on the plat are in close proximity to an existing oil and gas operation.

(c) Fencing. If any residential development is proposed to be located within five hundred (500) feet of an existing oil and gas operation, and if an existing fence does not surround the oil and gas operation, a fence must be erected by the developer along the property boundary between the oil and gas operation and the development that restricts public access to the oil and gas operation.

From Chart 1 (Land Use Intensities) Oil and gas operations, including plugged and abandoned wells have a Very High Intensity, with a buffer yard D requirement

Buffer Yard D requires the following plant material for every 100 feet at a 375 foot nominal buffer yard

- 6 Shade Trees*
- 7 Ornamental Trees or Type 2 Shrubs****
- 5 Evergreen Trees*
- 35 Shrubs (Type 2)*

Discussion

It is our understanding the residential buffering standards related to oil and gas operations were put into place to address visual and noise issues. The developers of Waters' Edge are proposing alternative mitigation to address visual and sound effects with the goal of reducing the buffer setback requirements to 150 feet and reducing the plant material required to buffer yard A requirements.

Project Background

Waters' Edge at Richard's Lake was originally recorded on July 19, 2010. As with most other developments, the housing downturn prevented Waters' Edge from moving forward. The original development time frame expired in July 2013, but we were granted a one-year extension of the approved plans to July 2014. Towards the end of 2013, the City adopted residential buffer standards, which had the effect of dramatically affecting Waters' Edge. In May of 2014 we applied for another one-year extension, but were denied since the project no longer met the residential buffering standards regarding oil and gas operations.

Well Locations

Within the Waters' Edge and adjoining Richard's Lake and Hearthfire neighborhoods, there are 4 operating well heads, and one (1) injection well.



Graphic of Well Head Locations

Well Head 1 is an existing operating pump within the Hearthfire neighborhood

Well Head 2 is an existing operating pump within Waters Edge, but immediately adjacent to Hearthfire

Well Head 3 is an existing operating pump within Waters Edge

Well Head 4 is an existing operating pump within the Richards Lake Neighborhood

Well Head 5 is an operating well that has no pump. Oil flows due to pressure.

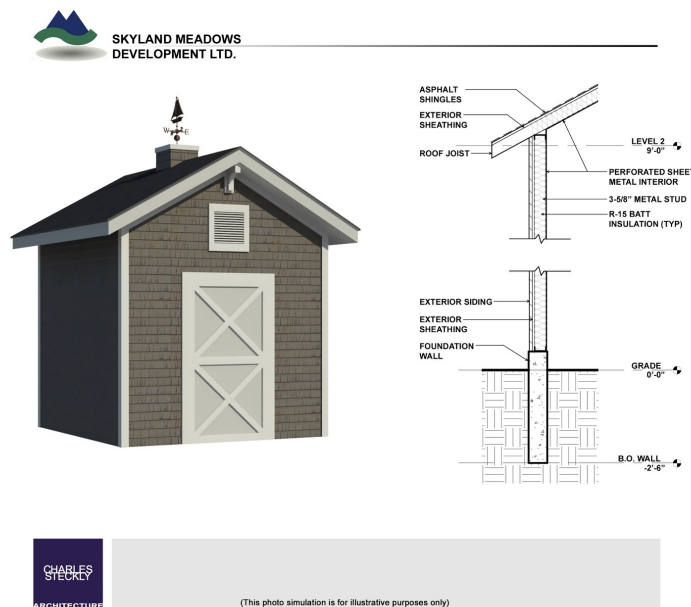
Waters' Edge originally was planned around the existing well heads with a 150-foot setback from the center of the wells to the edge of adjacent lots, the standard at the time and as required by the surface use agreement with the well operator. Hearthfire and Richard's Lake were both planned and approved with homes much closer than even that to the well heads. Street networks were also planned to work with the 150-foot setbacks in most locations.

Noise Levels

Since the City adopted the current buffer standards, the developer of Waters' Edge has been working with various professionals and the company that operates the well heads to reduce the visual and noise impacts of the wells.

To address the sound issue, Waters' Edge hired Engineering Dynamics, Inc. to measure the noise levels on all five existing well heads, and a sixth located on Terry Lake Road which was used as a test case, and to propose solutions. The study found the measured sound levels at the well heads ranged from 47.4 dBA to 62.2 dBA. At 150 feet from the well heads (our proposed setbacks), the existing noise levels ranged from 28.4 dBA to 36.5 dBA. It was also determined that the optimal designed sound level at the nearest residence should be 25 dBA. This is 5 dBA less than the background sound levels on a typical evening, given the conditions of no rain, wind, traffic, barking dogs, etc., for this area of Colorado.

Engineering Dynamics is recommending replacement of the current well heads with a pump system that is placed inside of a structure to reduce the noise levels to the desired levels. Such a structure already exists at the Terry Road well head location. Noise levels measured at this location indicated that, immediately adjacent to this well head, the sound levels were 56.7 dBA., similar to those at Waters' Edge. At 150 feet, however, the sounds levels dropped to less than 20 dBA, which is well under the target sound level. The structures are the size of a backyard storage shed and are similar in size to structures that cover irrigation pump systems at City parks. Waters' Edge has hired Charles Steckly Architects to prepare conceptual designs and images of how these structures would look. Engineering Dynamics has also determined that a structure could be built around the existing pumps which would provide the same noise-muffling effect.



Proposed Pump System Structure

Below are some before and after simulations showing how these structures may look.

HEARTHFIRE #1



CHARLES STECKLY ARCHITECTURE EXISTING CONDITIONS
(This photo simulation is for illustrative purposes only)

Existing Hearthfire well head w/ security fencing



SKYLAND MEADOWS DEVELOPMENT LTD.

OIL PUMP #1



CHARLES STECKLY ARCHITECTURE PROPOSED CONDITIONS
(This photo simulation is for illustrative purposes only)

Proposed Hearthfire well head placed inside a structure



EXISTING CONDITIONS

(This photo simulation is for illustrative purposes only)

Existing well head within Water's Edge



SKYLAND MEADOWS
DEVELOPMENT LTD.



PROPOSED CONDITIONS

(This photo simulation is for illustrative purposes only)

Proposed well head placed inside a structure

Landscaping

The standard buffer yard requirements for oil and gas operations required a buffer yard type ‘D.’ Vignette Studios has prepared a typical buffer scenario showing how this may look with the required plant material (see attached). As can be seen, this results in a massive amount of plant material which we estimate will cost approximately \$500,000 per well. Engineering Dynamics, Inc. also noted in their study that landscaping does little to mitigate actual sound levels, but does provide a visual as well as a psychological buffer. They further evaluated creating berms, and deduced that for berms to be effective, the berms would need to be 8-10 feet high. They do recommend some combination of berming, landscaping, or wooden privacy fencing be installed to the well heads to provide visual and psychological separation.

City of Fort Collins Air Monitoring Project

The City and the oil operators within Waters’ Edge completed an air monitoring project between November 15, 2013 and February 15, 2014. In this study, a well pad within Waters’ Edge, one in Hearthfire, and two sites in downtown Fort Collins were used to measure air quality for various breathable gases that would be expected from typical well operations. The study found that some gases were actually higher in downtown than at the well heads, and in all cases gases were not detected to be of concern at the well heads. Accordingly, the modifications requested will not negatively affect air quality in the areas surrounding the well heads.

Oil Well Operators

The developer of Waters’ Edge has discussed its intent to request this modification of standards with respect to the set-back and landscaping requirements at issue with the operators of the subject oil wells. That company, Memorial Production Partners, LP, has indicated that it will not object to the proposed modification of standards.

Hardships Imposed by the Existing Standards

Enforcing the 350-foot setback requirement would negatively impact the proposed development as follows:

1. Would result in a reduction of approximately 66 units, with an associated reduction in project revenues of approximately \$3.5 million;
2. Would impact the street network system, including required street connections and require extensive reworking of the existing plan; and
3. May potentially impact elements within the City of Fort Collins Richard’s Lake Park

SUMMARY AND JUSTIFICATION OF REQUEST FOR MODIFICATION OF STANDARDS

Based on the results of the Engineering Dynamics Study and other factors discussed herein, the developer of Waters' Edge proposes the following:

1. To replace the existing well heads, not only within Waters' Edge, but also the two well heads in Richard's Lake and Hearthfire with the pump system currently in use at the Terry Road well head location;
2. To cover the new pump systems with structures such as those shown in the illustrations provided; and
3. Install buffer yard "A" type landscaping around the site. (Buffer yard 'A' typical landscape requirements are attached at Exhibit D).

The modifications to existing standards requested are as follow:

1. Modify standards under 3.8.26(c) by reducing the setback requirements from 350 feet to 150 feet;
2. Modify standards under 3.8.26(c) by reducing the required buffer yard from a Type 'D' to a Type 'A'; and
3. Eliminate the landscape buffer requirements entirely in the event that one or more of the wells are abandoned.

JUSTIFICATION

Justification for the proposed modifications is as follows:

1. Enforcement of the current standards imposes a hardship on the project which occurred after the initial development plan was recorded;
2. The proposed installation of the low-profile pumps at the well heads with the cover structure reduces the noise levels below desired threshold levels even with a 150-foot setback buffer;
3. The cover structure addresses the negative visual impacts of the well heads thus obviating the need for heavy landscaping and rendering a Type "A" buffer yard sufficient; and
4. The proposed modifications provide a result that is equal to or better than that which would result by enforcement of the existing Land Use Code.

ATTACHMENTS

- A. Proposed Water's Edge Site Plan
- B. Engineering Dynamics Study
- C. Buffer yard 'D' typical landscape requirements
- D. Buffer yard 'A' typical landscape requirements
- E. Waters Edge Narrative

22 June 2015

Mr. Bill Swalling
 Waters' Edge Investments, LLLP.
 5935 S. Zang St., #230
 Littleton, CO 80127

Page 1 of 4

Voice: 303-949-2629

RE: Waters' Edge Well Head
 Noise Reduction Design Recommendations
 EDI Job # C-4058

Dear Mr. Swalling:

Engineering Dynamics' has investigated noise from Oil Well Heads at the proposed Waters' Edge development located in Fort Collins, Colorado. The letter describes results of sound level measurements which were taken at the five existing Well Heads in and around the Waters' Edge development and noise mitigation options and goals. Figure 1 shows the approximate locations of the Well Heads in and around the development site.

1.0 Site Investigation / Background

Sound level measurements were made a various distances from the drive motors at the five existing Wells Heads in and around the development site. Results of these measurements are shown in Figure 1.1 and Table 1.1. Figure 1.1 is the 1/3-octaveband frequency based sound levels emitted by each Well Head motor and is included more as reference. Table 1.1 shows the measured overall A-weighted sound pressure level at the measurement distance and at the estimated distance of 150 feet to the nearest residence. The measurement locations correspond to the Well Head location ID's given shown in Figure 1.

Table 1.1: Well Head Noise Levels

	WH 1	WH 2	WH 3	WH 4	WH 5	Terry Road with Enclosure
Measured Sound Levels	57.8 dBA @ 25 ft	55.8 dBA @ 15 ft	47.4 dBA @ 100 ft	49.8 dBA @ 50 ft	62.2 dBA @ 15 ft	56.7 dBA @ 3 ft
Sound Level at 150 feet	42.2 dBA	35.8 dBA	43.9 dBA	40.3 dBA	42.2 dBA	22.7 dBA
Sound Level at 150 feet	34.9 dBA	28.4 dBA	36.5 dBA	35.8 dBA	34.8 dBA	<20 dBA

An appropriate design goal is that sound levels from a Well Head at the nearest residence should be at least 5 dBA less than the background sound levels on a typical evening; no rain, no wind, no traffic, no dogs, etc. In this part of Colorado away from traffic typical background sound levels are in the range of 30 ± 3 dBA. Therefore, an appropriate design goal, is for Well Head sound levels to be 25 ± 3 dBA, at the nearest residence; not the nearest residential property line.

Inspection of Table 1.1 shows that using a surface pump, as is used at the Terry Road Well Head location inside an acoustical enclosure will yield sound levels below the design goal.

2.0 Recommendations

Reduction of pump jack noise can be accomplished by applying noise mitigation to the existing pump jack drive motor assembly or replacing the entire pump jack with an electrically driven pump.

- a. Replace existing pump jacks with in ground hydraulic pumps, similar to the existing Terry Road site. This site uses an electric driven hydraulic pump which hydraulically drives the well head pumps. The electric motor and hydraulic pump assembly enclosed in a noise enclosure, constructed as outlined in Section 2.1 below.
- b. Install noise enclosures around the pump jack drive motor portion (only) of the existing well heads. The noise enclosure around existing pump jack drive motors will be similar construction as outlined in Section 2.1 below. The actual size and configuration of these enclosures will need to be designed for maintenance and drive belt shroud access.

2.1 Terry Road Site

EDI's site inspection of the Terry Road site, with the acoustical enclosure showed that the well head hydraulic pump / motor noise is clearly audible through the entry door and the intake and exhaust cooling air silencers. This tone will be in-audible to slightly audible at distances of 100 to 150 feet, although less than the design goal of 25 dBA. Therefore, an acoustical enclosure similar to that at the Terry Road site is acceptable.

Typical construction for this type of enclosure is as follows,

Exterior sheet metal or siding (minimum gauge 20)

3-5/8 inch metal studs (minimum)

R-15 bat insulation in stud cavities.

Interior perforated sheet metal perforated sheet metal. The spec on the perforated sheet metal is
<http://www.mcnichols.com/product/17183132M2?navCode=cc:round&navCode=avc:AV-90661&navCode=avc:AV-36594>

Entry door – solid core metal with jamb seals and sweep.

Inlet and exhaust silencers similar to Pottorff Model 18x18x84 RFN 12P

<http://pottorff.com/media/resource/RFN%20-%20Rectangular%20Fiberglass.PDF>

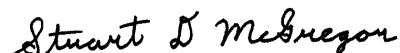
2.2 Landscaping and berming

While landscaping does little to diminish actual sound levels it does provide a psychological separation between the noise source and receiver and a psychological noise reduction. Additionally, for berming to provide any significant noise reduction the berms would need to be 8 to 10 feet high. Berms do however provide a psychological noise reduction.

Therefore, EDI recommends that some type of landscaping, berming, or wooden privacy type fencing be installed around the Well Head area.

If you have any questions, please contact me at our Englewood office.

Sincerely,
ENGINEERING DYNAMICS, INC.



Stuart D. McGregor, P.E.
Vice President

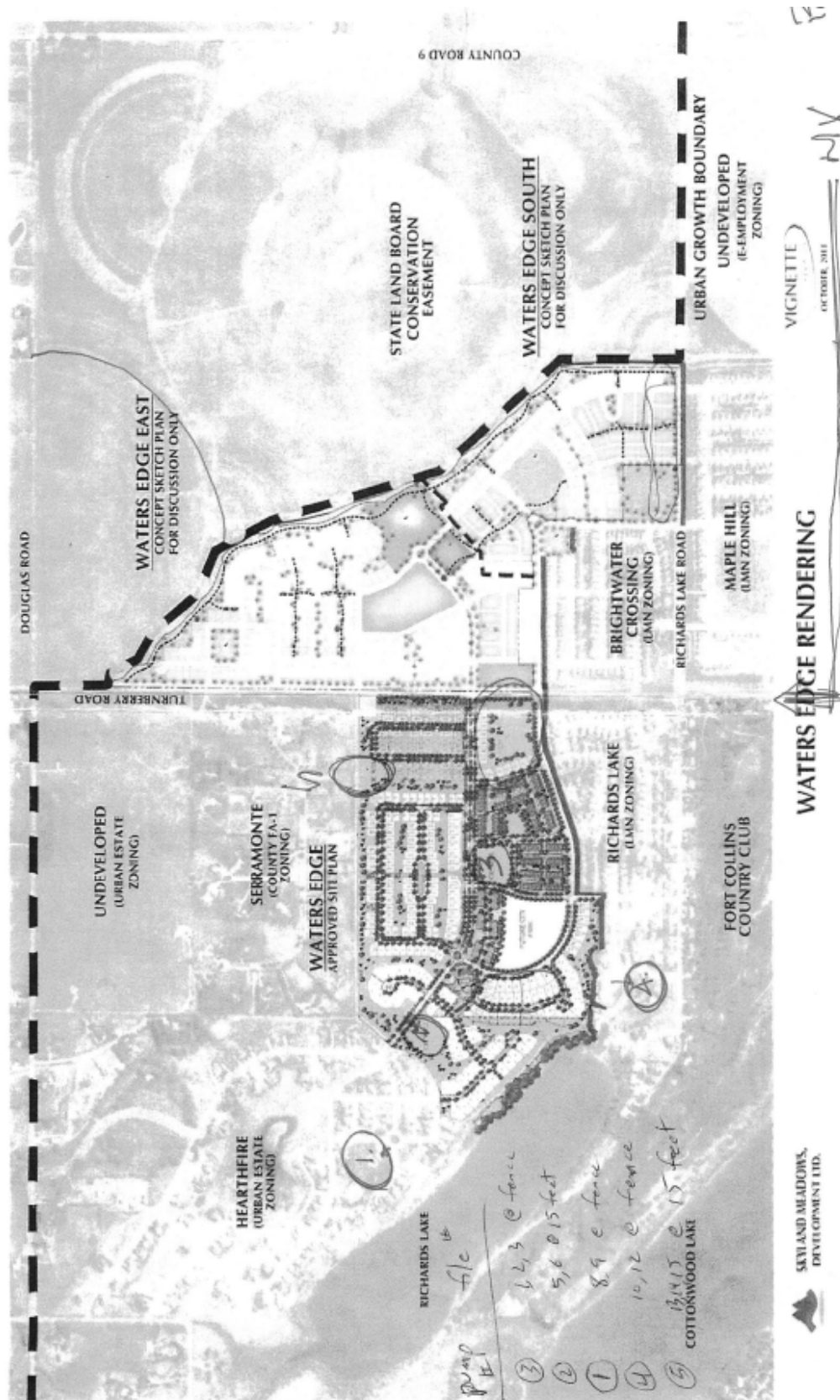
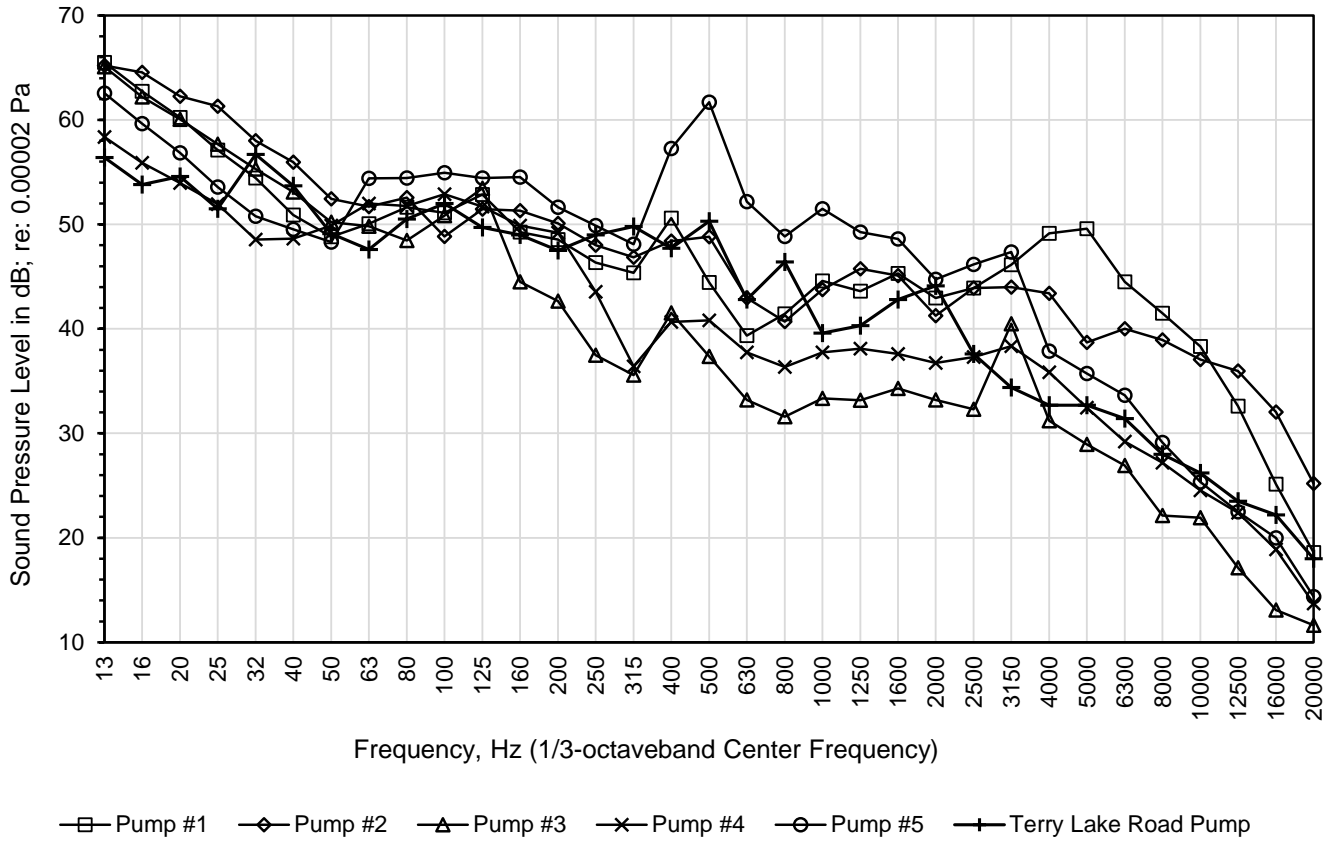
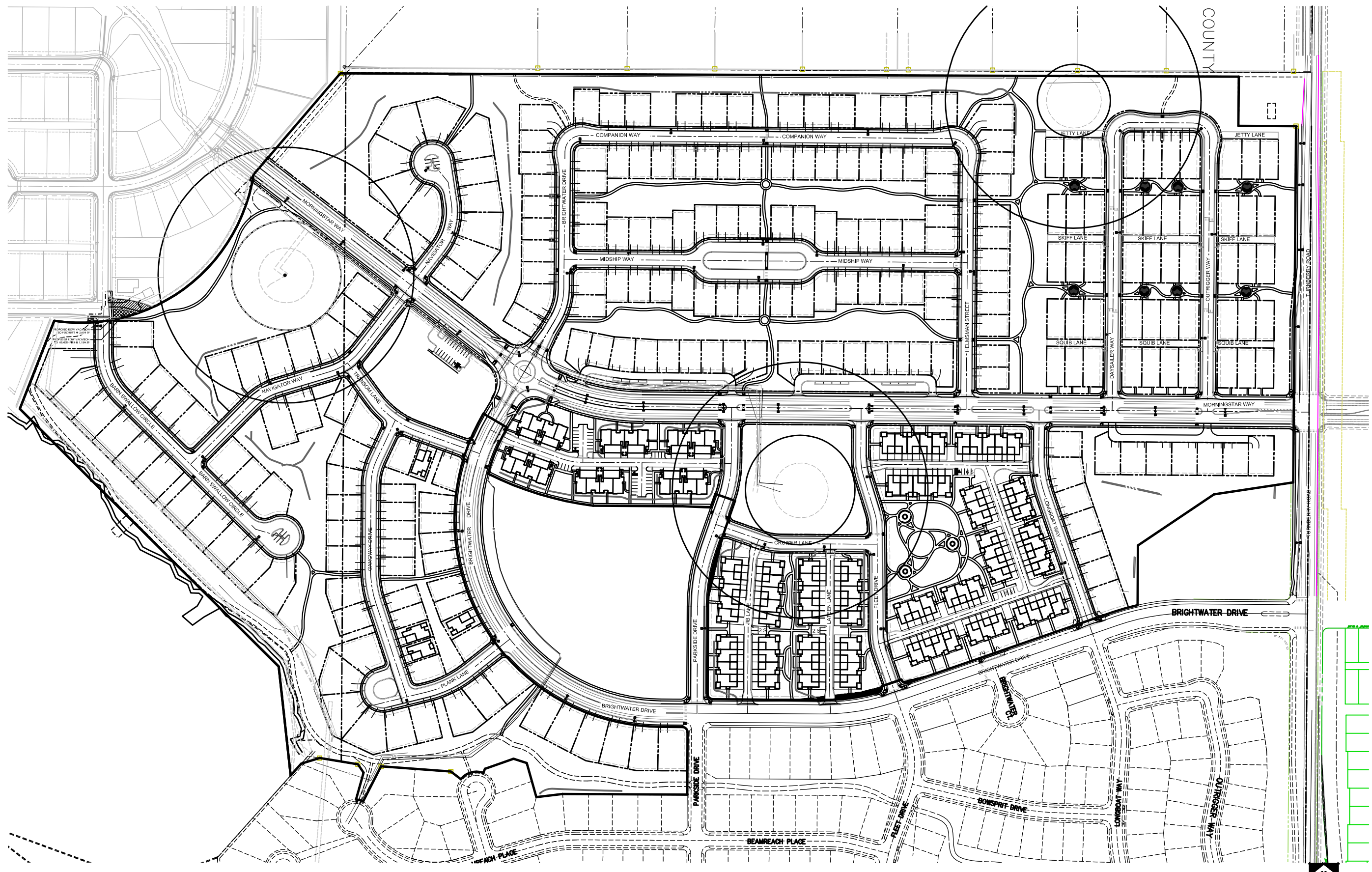


Figure 1:

Figure 1.1: Waters Edge Oil Pump Noise Levels





WATERS EDGE

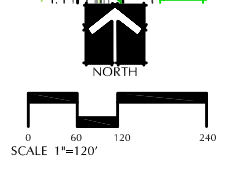
FINAL DEVELOPMENT PLANS
 FORT COLLINS, COLORADO

JOB NO:	13402
ACAD FILE:	13401FDP2
DRAWN:	TCH
CHECKED:	TCH
ISSUE DATE:	MAY 22, 2015
REVISIONS	DATE

SHEET TITLE:
**OVERALL
 SITE PLAN**

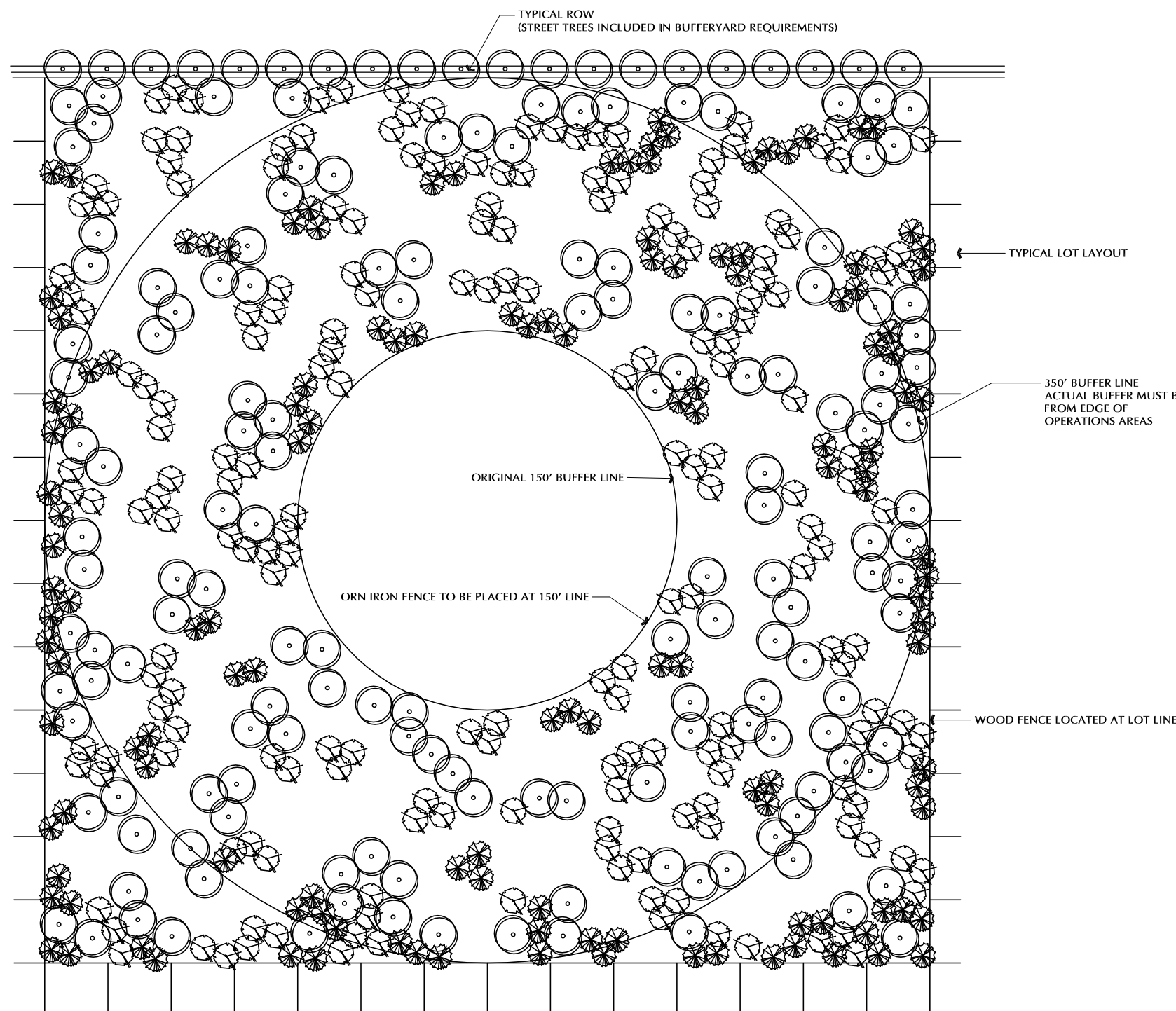
SHEET NO:
2 OF ?

EXHIBIT A WATERS EDGE SITE PLAN



CLIENT

Water's Edge Development
 LLLP
 7400 East Cresline Circle
 Suite 230
 Greenwood Village, Co.
 80111



BUFFERYARD TYPICAL STANDARDS

350' MINIMUM BUFFER
 6' FENCE REQUIRED WHERE BUFFER IS LESS THAN 500'

BUFFERYARD TYPE D REQUIRES THE FOLLOWING

PLANT MATERIAL
 FOR EACH 100 LINEAR FEET OF BUFFER.
 6 SHADE TREES
 7 ORNAMENTAL TREES
 5 EVERGREEN TREES
 35 SHRUBS (TYPE 2)

FOR THIS EXAMPLE, BELOW IS THE TOTAL AMOUNT OF PLANT MATERIAL REQUIRED

146 SHADE TREES @ \$350	\$51,100
170 ORNAMENTAL TREES @ \$210	\$35,700
130 EVERGREEN TREES @ \$290	\$37,700
845 SHRUBS (TYPE 2) @ \$40	\$33,800
2,800 LF 6' FENCING @ \$22 LF	\$61,600
950 LF 8' ORN. IRON FENCE @ \$40 LF	\$38,000
390,000 SF SOIL PREP AND SEED @ \$.15	\$58,500
100,000 SF MULCH @ \$1	\$100,000

IRRIGATION

ANNUAL WATER USE 1,557,320 GALLONS	
1 INCH IRRIGATION TAP	\$20,000
IRRIGATION SYSTEM COST. COSTS	\$85,000

TOTAL BUFFERYARD COSTS \$521,400

ANNUAL IRRIGATION WATER COSTS \$5,000

EXHIBIT C - TYPE D BUFFERYARD TYPICAL

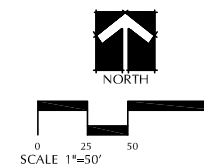
**Waters Edge
 at Richard's Lake**
 FINAL DEVELOPMENT PLANS
 FORT COLLINS, COLORADO

JOB NO: 13502
 ACAD FILE: 13502FDP3
 DRAWN: TCH
 CHECKED: TCH
 ISSUE DATE: APRIL 13, 2015

REVISIONS	DATE

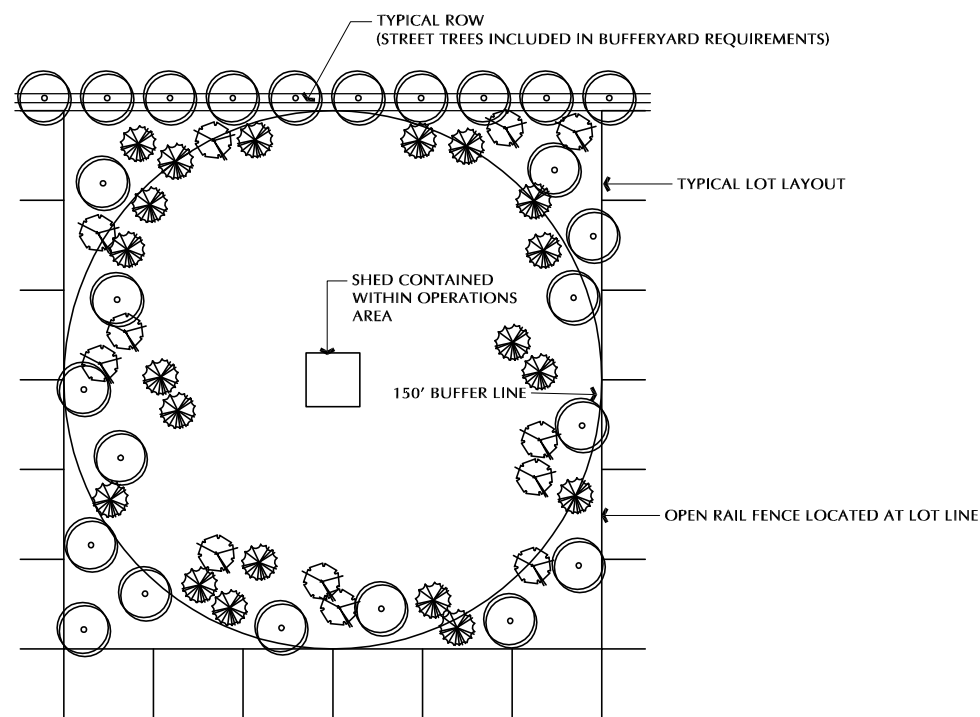
SHEET TITLE:
**TYPICAL WELL
 BUFFER REQ.**

SHEET NO:
1 OF 1



CLIENT

Water's Edge Development
LLLP
7400 East Crestline Circle
Suite 230
Greenwood Village, Co.
80111



BUFFERYARD TYPICAL STANDARDS

150' MINIMUM BUFFER
6' FENCE REQUIRED WHERE BUFFER IS LESS THAN 500'

BUFFERYARD TYPE D REQUIRES THE FOLLOWING PLANT MATERIAL

FOR EACH 100 LINEAR FEET OF BUFFER (WITH 50% REDUCTION FOR WIDTH OF BUFFER)

- 1.5 SHADE TREES
- 1 ORNAMENTAL TREES
- 1.5 EVERGREEN TREES
- 3 SHRUBS (TYPE 1)
- 5 SHRUBS (TYPE 2)

FOR THIS EXAMPLE, BELOW IS THE TOTAL AMOUNT OF PLANT MATERIAL REQUIRED

- 20 SHADE TREES
- 12 ORNAMENTAL TREES
- 20 EVERGREEN TREES
- 96 SHRUBS (TYPE 1&2)

EXHIBIT D - TYPE A BUFFERYARD TYPICAL

**Waters Edge
at Richard's Lake**
FINAL DEVELOPMENT PLANS
FORT COLLINS, COLORADO

JOB NO: 13502
ACAD FILE: 13502FDP3
DRAWN: TCH
CHECKED: TCH
ISSUE DATE: JUNE 23, 2015

REVISIONS DATE

REVISIONS	DATE

SHEET TITLE:
**TYPICAL TYPE A
BUFFER REQ.**

SHEET NO:

1 OF **1**

