Helena Valley Area Plan

Infrastructure Economic Analysis

(Helena Montana 2006) https://en.wikipedia.org/wiki/Helena,_Montana#/media/File:Helena_Montana-2006.jpg

October 2015

Prepared by:

GreatWest engineering ®

Prepared for:

Lewis & Clark County
Community Development & Planning Department

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October 21, 2015 *Delivered Via Email (GThebarge@lccountymt.gov)*

George Thebarge, AICP
Lewis & Clark County – Director of Community Development & Planning
316 North Park Ave.
Helena, MT 59623

RE: Helena Valley Area Plan, Infrastructure Economic Analysis
Final Deliverable

Dear Mr. Thebarge,

Great West Engineering would like to present the completed Infrastructure Economic Analysis (IEA), which Lewis & Clark County intends to assimilate as a Chapter in the 2015 Growth Policy Update. The finalized deliverables include: a narrative that provides the context for the entire chapter; tabular cost data that outline the findings of the infrastructure economic analysis; and an identification of potential funding opportunities that might help to facilitate extensions of municipal water and sewer services to future developments planned inside of the Urban Standards Boundary.

The included opinions of probable cost provide an infrastructure investment comparison between two hypothetical build-out scenarios for the 46 Degrees North Subdivision along N. Montana Avenue. One scenario is based upon the subdivision being developed to the current County Subdivision Regulations (including the costs of water supply wells and absent curb & gutter). The other scenario provides an opinion of the cost to construct the subdivision with annexable infrastructure meeting City of Helena Engineering Standards. It is important to note that the included opinions of cost are of a high-level nature and include numerous assumptions based upon the best information available for this specific development & location.

We have appreciated this opportunity to provide our professional services. Please don't hesitate to contact me with questions regarding this process or our economic evaluations of these development scenarios.

Sincerely,

Great West Engineering, Inc.

Cole Peebles, PE
Project Manager

Encl: (1) PDF & (2) Hardcopies: Infrastructure Economic Analysis *(delivered via courier)*

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Helena Valley Area Plan
Infrastructure Economic Analysis

Technical Narrative Chapter
In consideration of the 2015 Growth Policy Update

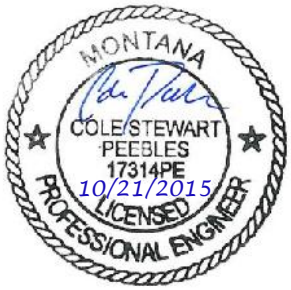
Prepared For:

Lewis & Clark County
Community Development & Planning Department

October 2015

Prepared By: *Cole Peebles, PE*

Authored By: *Jerry Grebenc, Senior Planner*



GreatWest engineering ®

Chapter 4: Infrastructure Economic Analysis

A Better Understanding of Trends & Economics that have Driven Residential Development in the Helena Valley

The current pattern of residential growth in the Helena Valley is neither environmentally or economically sustainable in the long-term. According to data collected by the Lewis and Clark County Planning Department, over the last two decades approximately two-thirds of residential growth has occurred in areas of the Valley where water availability, emergency response and road capacities are not always adequate to support the housing densities that have been constructed. In fact, much of the current infrastructure in the Valley was never designed or intended to support the housing densities that exist, particularly on the periphery of the Valley.

The Development Dilemma:

The list of infrastructure issues in the Helena Valley would be familiar to most of its residents:

- failing roadways,
- ongoing depletion of groundwater resources,
- declining groundwater quality,
- delayed emergency response times,
- flooding,
- etc.

As stated in Chapter 3, these and other issues will have to be addressed in order to ensure a more sustainable model of residential growth for the future. Doing so will require not only public support and appropriate planning, but also substantial financial resources to provide the infrastructure necessary to support higher housing densities.

Past Development & Impacts on Infrastructure Investment

Over the past 20 years, infrastructure expenditures in the Helena Valley have been focused on facilities and services such as individual wells and septic systems, which have little-to-no capacity to be expanded or to accommodate future residential development. The County is examining options to shift the current planning and development paradigm from one that is driven by the use of limited-life, localized

infrastructure systems to a new approach that would focus planning and financial resources on providing sustainable municipal services to promote and guide growth into the Urban Standards Boundary adjacent to the City of Helena.

In recent history, the location of residential housing in the Helena Valley has been dictated by the economics of land development, with very limited influence from land use planning and policies. Because of this, the Helena Valley Area Plan is being developed in a manner that coordinates land use planning with the reality of land development economics. Therefore a solid understanding of the financial costs of land development is essential to the success of this plan.

Land Use Planning

Conservative population estimates by the County Planning Department indicate that up to 4,000 new homes will be built in the Valley over the next 20 years. With an average household size of 2.39 people in Montana, this could mean that upwards of 9,500 additional people could be living in the Valley. In order to address the existing environmental and infrastructure concerns, the County would like to work with the City of Helena to encourage up to two-thirds of those new homes to be constructed within the designated Urban Standards Boundary. This approach would be achieved through a combination of policies ranging from the use of zoning and subdivision regulations to a major investment in infrastructure, particularly municipal water and sewer service, in order to incentivize urban development. This chapter is focused upon that potential investment in residential infrastructure and understanding its costs in both the County and in the City of Helena.

Previous Infrastructure Analyses & Strategies

A number of infrastructure studies have been completed for the Helena Valley. Most were done on a macro/regional scale and did not examine the infrastructure costs of an actual subdivision designed to meet either County or City of Helena standards. Digests of two significant past study efforts follow.

The Helena Area Wastewater Treatment Facilities Plan (HAWT)

The HAWT is one example of a planning study that was developed for Lewis and Clark County in 1998 by Damschen and Associates. The report focused on three main topics: 1) characterizing wastewater treatment in the Valley; 2) identifying solutions to wastewater problems; and 3) detailing the cost effectiveness of each solution. HAWT presented six alternatives that ranged from taking no action on

wastewater treatment issues to the other end of the spectrum - building a regional wastewater treatment system. The plan estimated that upgrading the Helena Wastewater Treatment Plant for a regional system alone would cost approximately $10 million, while installing sewer lines in the remainder of the Valley would require between $30 million and $40 million (in 1998 dollars). Based on the HAWT Facility Plan, the Lewis and Clark County Commission selected a preferred alternative that included upgrading the City of Helena wastewater treatment system to meet its current as well as future needs. The County's Plan also recommended that the existing privately-owned "public" wastewater treatment systems such as Treasure State Acres and Pleasant Valley be upgraded and/or repaired, and that new residential development in the Valley either connect to adjacent, privately owned and operated wastewater treatment systems or develop their own "public" systems. For the more rural areas of the Valley, the County's alternative recommended the continued use of individual onsite septic systems and wells.

North Helena Valley Infrastructure Study

Another infrastructure analysis, the (NHVIS), was commissioned by the County Commission and completed by Anderson and Montgomery in 2005. The study examined solutions to infrastructure problems in the North Valley that were related to an inadequate transportation system and declining groundwater levels due to the impacts from the withdrawal of groundwater in order to serve the area's housing developments. The study found that just to bring the transportation network of the area up to the existing County Road Standards and to accommodate future vehicle traffic, the estimated cost was between $16 million and $23 million. The study also examined alternatives for providing drinking water to the area via a public system. Two alternatives were identified. The first would have acquired water rights for a system and used groundwater wells to pump drinking water up to the residential developments in the area. The cost to build this system was projected at $8 million to $20 million. The second alternative proposed extending a water main from the City of Helena to the North Hills. The cost of this option was estimated at $16 million to $20 million.

Please refer to Chapter 3 of the Growth Policy Update for a more comprehensive discussion of past planning efforts for the Helena Valley.

The Need for a New Study

While both HAWT, the NHVIS, and other planning documents have previously discussed solutions and costs for addressing area wide infrastructure deficiencies, none have compared the costs of infrastructure for residential developments in the Helena Valley with the costs of similarly-sized developments in the City of Helena.

Subdivision Infrastructure Economic Analysis (IEA)

Capital Investment: an Infrastructure Cost Investigation – Lewis & Clark County Development as compared to City of Helena Development

Many people assume that building new homes and the associated public service infrastructure in the City of Helena is more expensive than similar development in the Helena Valley. This assumption has never been evaluated through a specific analysis. It is with this in mind, that much of this chapter is focused upon providing cost evaluations and identifying the "cost differences" between constructing infrastructure for residential housing in the County as compared to housing in the City of Helena. This comparison is essential to understanding the economic reality of trying to promote higher residential densities within the Urban Standards Boundary adjacent to the City.

In order to examine the relative costs of housing infrastructure, Lewis and Clark County, in consultation with Great West Engineering, prepared an analysis that compared the costs of developing a residential subdivision in both the County and the City of Helena. The cost comparison analyzed two variations of a previously proposed subdivision, 46 Degrees North, and provided an Engineer's Opinions of Probable Costs for the infrastructure costs for both alternatives. The first variant was based upon the requirements of the Lewis and Clark County Subdivision Regulations and the second upon the Engineering and Design Standards of the City of Helena. The analysis focused on the approximate upfront investments that would be required of a developer for each build-out variation.

46 Degrees North was a 92 lot subdivision that was granted preliminary plat approval by Lewis and Clark County in April of 2015. The property is located just north of the City of Helena, with the Treasure State Acres Subdivision adjacent to the north, Resurrection Cemetery adjacent to the southwest, North Montana Avenue adjacent to the west and Interstate Highway 15 to the east. The property is roughly 60 acres in size and is located inside of the proposed Urban Standards Boundary.

Subdivision Variant #1: County Subdivision Standards

The analysis for the County Variant examined the infrastructure costs for the 46 Degrees North Subdivision based upon the standards required under the current version of the Lewis & Clark County Subdivision Regulations and the design information included in the Subdivision Plat Submittal prepared by Heller Development, LLC. The build-out analysis was for 88 residential lots and 4 commercial lots.

The Preliminary Plat for the subdivision was submitted by the developer and reviewed by Lewis & Clark County prior to Judge Jeffrey Sherlock's ruling on exempt wells in October of 2014. Therefore, per the developer's preliminary design, drinking water for this analysis was assumed to be supplied to homes and businesses via individual and shared wells. Historically, homeowners have paid to have water wells drilled following the purchase of a parcel(s) from the Developer. However, for the purposes of this analysis—and in order to present as impartial a comparison as possible of the initial capital infrastructure costs between traditional developments in the County and the City—the estimated costs of the groundwater wells were incorporated as part of the overall water supply infrastructure costs for the County Version of this economic evaluation.

Wastewater treatment was analyzed assuming treatment through a community system using the large subsurface drainfield (as designed in the Plat Submittal). The road network for the subdivision was evaluated using the County Road Standard, Typical Paved Road Section for Local Roads. Based upon the construction of similar roads in the area, an average 4-inch thickness of subbase import was assumed across the site. The analysis of the road system assumed that no sidewalks or curbs were included along the roadways. Stormwater conveyances such as ditches, culverts, and swales/impoundment were assumed to meet County Subdivision Standards. No design was performed as part of this evaluation.

Cost Summary – Current County Standards

The overall opinion of cost for the construction of infrastructure for the County Variation of 46 Degrees North was $4.4 million. This translated into an approximate average of $48,100 per lot. Table 1a (following) summarizes the probable infrastructure costs of the County Variant of 46 Degrees North.

Table 1b in Appendix A presents a more detailed assessment of the Engineer's Opinion of Probable Cost for the County Alternative.

TABLE 1a OPINION OF PROBABLE COST 46 Degrees North Subdivision - County Standards		
Work Group	**Infrastructure Category/Description**	**Amount**
A	*Road Corridor*	*$ 795,000*
B	*Storm Water*	*$ 178,000*
C	*Sanitary Sewer*	*$ 1,635,000*
D	*Water Supply (Including Wells)*	*$ 846,000*
E	*Fire Protection*	*$ 232,000*
F	*Professional Services*	*$ 740,000*
TOTAL CONSTRUCTION		**$ 4,426,000**

Total Number of Lots		**92**
Cost to Construct the Subdivision (allocated evenly over each lot)	**$**	**48,100**

Subdivision Variant #2: City Development Standards

The second variant of this study was based loosely upon an alternate high-density layout, which the developer presented for the Planning Department's consideration in response to the County Commission's conditional approval requirements for the original Plat Submittal. Therefore, this City Scenario evaluated a subdivision built with urban densities and in the same footprint as the County-approved 46 Degrees North project. This variation included 158 residential lots and 4 commercial lots, with the assumption that the project would be constructed to meet the requirements of the City of Helena (for possible annexation in the future). The alternate high-density concept prepared by Heller Development, LLC included provisions for City Water and Sewer services. To further improve the objectivity of this study, City-compliant street, sidewalks & stormwater management were also included.

Water and sewer for this alternative would be supplied via City Services extended to the subdivision. An interior sewer network would collect sanitary waste and deliver it to a newly constructed sewer trunk main for treatment at the City of Helena Wastewater Treatment Facility. Raw sewage would be delivered via a new lift station to be located within the subdivision. Water service was analyzed as though it would be provided to the subdivision via a network of looped water mains extending from the City's existing network. Costs for water and sewer main extensions to the subdivision were based upon

an April 2015 preliminary engineering report (PER) compiled by Morrison Maierle, Inc. at the request of the City of Helena. This PER estimated the costs to provide water and sewer service to an area including 46 Degrees North and the vacant properties located south of the subdivision and between North Montana Avenue and Interstate 15. Based upon the PER, the preliminary analysis of this variant addressed only the infrastructure identified in Morrison Maierle's PER that would be necessary to provide technically feasible utilities to the subdivision, all meeting City Standards. Peripheral infrastructure discussed in the PER, such as the Wolf Road lift station, was not included in this cost analysis. Preliminary diagrams of the included water and sewer extensions have been adapted from Morrison Maierle's PER and can be found in Appendix A.

City-Variant Subdivision Infrastructure Summary

The analysis for this development option required the following infrastructure to be constructed:

Design Consideration #1: Sewer

- 12-inch sewer trunk mains adjacent to and within the subdivision, including a stub connection that would begin just north of the Helena Valley Irrigation District Canal;
- 8-inch collection mains internal to the subdivision;
- A new lift station located in the northeast corner of the property to pump effluent; and
- Force main from the lift station to the existing sewage trunk main at Custer Avenue.

Design Consideration #2 Water

- 20-inch water main extending along North Montana Avenue from the southwest corner of Resurrection Cemetery to the northwest corner of the 46 Degrees North property.
- 12-inch water mains along the major streets within the subdivision,
- 8-inch interior distribution water mains along the minor subdivision streets, and
- 12-inch water main loop extension from the southeast corner of the subdivision, running approximately 2,750 feet south along the west side of Interstate 15 to an existing water main near Lowes along Custer Avenue.

Design Consideration #3: Stormwater

Stormwater management was evaluated according to the City's Municipal Separate Storm Sewer System (MS4) Permit. The preliminary stormwater layout and costing for this alternative

assumed surface collection of stormwater via curb and gutter, routing via subsurface storm drain and surface detention & infiltration. For simplicity of analysis and estimation, the preliminary design assumed that the existing topography, groundwater table, and subsurface soils on the site of the 46 Degrees North Subdivision would allow for onsite retention and total infiltration of stormwater. Stormwater under this scenario would be mitigated and/or infiltrated to meet the City of Helena Standards.

Design Consideration #4: Roadway Corridor

The street network for the subdivision was designed to include paved roads, curb and gutter, boulevards, and concrete sidewalks meeting the City of Helena's Engineering and Design Standards. The costs of street development were based upon the minimum City Standards for soil preparation and the minimum base and asphalt thicknesses. Based upon the construction of other similar roads in the area, an average 4-inch thickness of subbase import was assumed across the site. Street lighting was examined as though meeting the standard of care for City illumination.

Cost Summary – City of Helena Standards

The opinion of probable cost to provide utility infrastructure to this City Alternative was approximated at $11.2 million. This would mean that the average cost of all initial infrastructure required for the subdivision would be roughly $69,400, distributed equally over each lot. The opinion of cost included the infrastructure necessary to service the homes and businesses within the subdivision as well as the costs of extending and upsizing the water supply and sewage collection mains in order to serve the needs of future development in properties located around the subject property. Table 2a (following) details the costs of the facilities for the entire project, including the extension of infrastructure.

TABLE 2a OPINION OF PROBABLE COST (INCLUDING UTILITY EXTENSION WORK) 46 Degrees North Subdivision - City of Helena Annexable			
Work Group	**Infrastructure Category/Description**	**Amount**	
A	*Road Corridor*	*$*	*2,930,000*
B	*Storm Water*	*$*	*1,311,000*
C	*Sanitary Sewer*	*$*	*2,521,000*
D	*Water Supply*	*$*	*2,348,000*
E	*Fire Protection*	*$*	*405,000*
F	*Professional Services*	*$*	*1,720,000*
TOTAL CONSTRUCTION[i]		**$**	**11,235,000**
Included Investment to Extend City of Helena Water & Sewer to the Development		*$*	*1,276,000*

Total Number of Lots		**162**
Cost to Construct the Subdivision (allocated evenly over each lot)	**$**	**69,400**

[i] *This City variant includes only the infrastructure identified in Morrison Maierle's 2015 PER that would be necessary to provide technically feasible utilities to the subdivision, all meeting City Standards. Other peripheral infrastructure as discussed in the PER, such as the Wolf Road Lift Station (totaling roughly $ 3.6 million), was not included in this cost analysis.*

Cost Breakdown – Offsite City Water & Sewer Extension

As demonstrated in Table 2a, of the $11.2 million in total infrastructure costs, the approximate investment in the offsite improvements needed to extend water and sewer infrastructure from the City Limits to the subdivision boundary was estimated at $1.3 million (or an approximate average cost of $7,900 per lot).

Cost Breakdown – Intra-Development City Water & Sewer Network

Table 2b illustrates the relative cost of the infrastructure ($10.0 million) needed to service the 46 Degrees North subdivision excluding utility extension work. Excluding the cost of extending water and sewer mains from the City to the Development, the internal infrastructure investment in this exercise breaks down to an average of $61,500 per lot.

Table 2b also includes a rough approximation of the probable investment ($1.2 million) required in order to upsize the internal water and sewer infrastructure within the City Variant of 46 Degrees North such that additional capacity is available to service the surrounding developable land in the future.

TABLE 2b OPINION OF PROBABLE COST (INTERNAL UTILITIES ONLY) 46 Degrees North Subdivision - City of Helena Annexable			
Work Group	**Infrastructure Category/Description**	**Amount**	
A	*Road Corridor*	*$*	*2,930,000*
B	*Storm Water*	*$*	*1,311,000*
C	*Sanitary Sewer*	*$*	*2,102,000*
D	*Water Supply*	*$*	*1,687,000*
E	*Fire Protection*	*$*	*405,000*
F	*Professional Services*	*$*	*1,524,000*
TOTAL CONSTRUCTION[ii]		**$**	**9,959,000**
Included Investment in Upsized Water & Sewer Pipe and in Lift Station Capacity (Approximate)		*$*	*1,238,000*

Total Number of Lots		**162**
Cost to Construct the Subdivision (allocated evenly over each lot)	**$**	**61,500**

[ii] *This table excludes the approximated costs of utility extension work between the City Limits and the subdivision boundary, but does include upsized piping within the development as well as a full-capacity North Side Lift Station.*

Table 2c in Appendix A presents an itemized Engineer's Opinion of Probable Cost of the City-annexable Alternative.

Infrastructure Cost Considerations

The extension and upsizing of off-site infrastructure such as water and sewer mains to service future residential and commercial development is a practical and common sense policy. It is essential to avoid the opportunity cost of having to replace infrastructure that was originally sized too small to service future capacity needs. Requiring upsized infrastructure can ensure that water and sewer mains and street surfaces can remain in place for long periods of time, thus avoiding the costs associated with the need to tear up roadways and other utilities simply to upgrade water and sewer lines to allow for new development. That being said, the additional costs of extending, overdesigning, and upsizing infrastructure factors into the choices made by developers when they are trying to decide whether to creating housing in the County or the City.

Developers in the Helena Valley have a financial incentive to pursue the most expedient and profitable course when selecting infrastructure for their housing projects. This has historically meant using

individual wells and non-municipal wastewater treatment systems such as septic systems. Many developers are focused on short term, development-specific costs of providing infrastructure. Hence wells and non-municipal systems are an attractive alternative for developers and homeowners alike as they require low up front construction capital. This trend contrasts with the process a developer must follow to request annexation and connect to City of Helena services, which traditionally means incurring extra costs and potential time delays for a housing project. Absent motivations or requirements to connect to municipal systems such as the City of Helena's, developers have had an inherent incentive to use point-of-use style infrastructure such as community wastewater treatment systems or septic systems for their projects. Also, there is little-to-no incentive to install community amenities or safety upgrades, such as street lighting, sidewalks, parks, or wider streets. This situation makes it challenging to change the current paradigm of land use in the Helena Valley and therefore to reduce the impacts upon the Valley's groundwater resources and transportation networks.

Catalyzing Development Change

Financial Incentives & Partnerships for Sustainable Growth inside the USB

As discussed in Chapter 3 of the 2015 Growth Policy Update, there are numerous ways for the County to help catalyze a shift in this development paradigm and to guide the building of more sustainable housing. This study focuses on housing development that would occur inside the Urban Growth Area, and using the City's infrastructure. Policy Option # 1, Investment Strategy # 3c from Chapter 3 describes targeted investment partnerships between private entities such as developers and the public that might help incentivize this growth strategy.

Integrated Growth Management – Infrastructure Investment

According to Lewis & Clark County's approach to Integrated Growth Management moving forward, emphasis will be placed on infrastructure investment. For example, where it makes technical sense, Lewis & Clark County would like to explore mechanisms to help offset the initial capital costs of offsite infrastructure such as extending and upsizing water and sewer mains to vacant developable land. In this scenario, residents would pay back public infrastructure investments made by the County over time.

Improvement Districts (IDs)

To facilitate pay-back, the County will consider creating an Improvement District(s) through Interlocal Agreements. The Board of County Commissioners has the statutory authority to authorize the creation of IDs. IDs are a means used by County Governments to fund the construction and maintenance of needed public improvements in areas outside incorporated cities and towns. The formation of an ID would enable the County to generate funds to offset a portion of (or all of) the upfront costs of offsite utility extensions.

Improvement Districts & Funding Partnerships

Because IDs are considered an independent entity, they become eligible for a variety other potential funding mechanisms, which might help to pay for the offsite costs of upsizing and extending infrastructure. The following sections provide brief descriptions of some of the potential public-private funding partnerships, which may be available via the ID and whether or not Lewis and Clark County, (or the City of Helena) would be eligible to help administrate those funds via an improvement district(s).

Treasure State Endowment Program (TSEP)

TSEP is a State-funded grant program, which is administered by the Montana Department of Commerce (MDOC). TSEP provides financial assistance to local governments for infrastructure improvements. Grants can be obtained from TSEP for up to $500,000 if the projected water and sewer user rates are at least the target rate; for up to $625,000 if projected user rates are between 125% and 150% of the target rate; and for up to $750,000 if the projected user rates are over 150% of the target rate. TSEP grant recipients are required to match the grant dollar for dollar, but the match may come from a variety of sources including other grants (see below), loans, or cash contributions.

The MDOC has set the monthly Target Rate for the City of Helena at $88.77 (this includes water & sewer). Based on City Statistics and Water & Sewer User Rates, the average City Household user rate is $61.18 per month. This means that in order to be eligible for TSEP funding, the population base within the previously described ID would have to pay an additional monthly infrastructure recovery assessment of $27.59 per month. TSEP grants are highly competitive and are funded based upon demonstrated need. As such, it will likely be difficult for the County or its RID partnerships to capitalize on TSEP funding.

Renewable Resource Grant and Loan Program (RRGL)

RRGL is a State program that is funded through interest accrues on the Resource Indemnity Trust Fund and the sale or Coal Severance Tax Bonds and is administered by the Montana Department of Natural Resources and Conservation (DNRC). The primary purpose of the RRGL is to enhance Montana's renewable resources. For public facilities projects that conserve, manage, develop, or protect renewable resources, grants of up $125,000 are available.

A convincing case could likely be made that constructing up to 2600 new houses, which are serviced via City Water and Sewer is more environmentally sustainable than building the same number of homes with individual water supply wells and septic wastewater systems.

Community Development Block Grant (CDBG) – Public Facilities

CDBG is a federally funded program that is also administered by the Montana Department of Commerce (MDOC). CDBG funds community infrastructure improvements, such as water and sewer facilities, affordable to low and moderate income (LMI) families. Hence, a municipality must be at least 51 percent to be eligible. A community's LMI is usually determined by the 2010 Census.

The CDBG grant funds can be applied for in an amount of up to $450,000 with a limit of $20,000 per benefitted household. The use of CDBG funds requires a 25% local match that can be provided through cash funds, loans, or a combination thereof.

In order to capitalize on CDBG Public Facilities Grants, the developments and its RID partnerships would need to meet MDOC's LMI Requirements. While possible, this caveat may prove problematic.

State Revolving Fund (SRF)

SRF provides low-interest loan funds for both water and wastewater projects through the Drinking Water State Revolving Fund (DWSRF) and the Water Pollution Control State Revolving Fund (WPCSRF), respectively. The SRF program is administered by the Montana Department of Environmental Quality. Current loan terms include an interest rate of 2.50% for a 20 year period.

Low-interest SRF loans may help the City/County to assist in funding City utility service extensions to certain areas located inside the USB.

USDA Rural Development (RD)

RD provides grant and loan funding opportunities to municipalities for water and wastewater projects that improve the quality of life and promote economic development in Rural America. Municipalities with a population of less than 10,000 are eligible to apply, though; priority is given to those with a population of less than 5,500.

Grant eligibility and loan interest rates are based on the community's median household income (MHI) and user rates. If the area to be served has a MHI of $38,296 and $24,250, up to 45% of the project costs are grant eligible. Up to 75 % of the project costs are grant eligible if the planning area has an MHI less than $24,250 and the project is necessary to alleviate a health and/or sanitation concern.

As the population inside of the planned Urban Standards Boundary (USB) exceeds the 10,000 person population cut-off, RD will likely not be interested in forming a funding partnership for utility extensions inside the USB.

INTERCAP

INTERCAP provides loan funds at a low cost, variable interest rate to local governments. The program is administered by the Montana Board of Investments and is very flexible in the variety of funding which would include both water and wastewater projects. There is no funding cycle (funds are always available), however, the maximum loan term is 15 years. The current interest rate is 1.25%

These low-interest loans may help incentivize public utility extensions to viable areas located inside the USB, particularly if interim financing is necessary for the implementation of capital projects.

Lewis & Clark County understands the importance of developing collaborative partnerships as early in the process as possible. Discussions with the County's Grants Coordinator regarding the above funding opportunities have already been initiated. A future step in the implementation of

the Growth Plan Update will likely include open discussions between Lewis & Clark County, the City of Helena, potential Funding Agencies, and Developers regarding extensions of public utilities via Improvement Districts.

Improvement Districts and funding collaborations are important tools; however, as discussed in Chapter 3, infrastructure investment is only one piece of the County's multi-pronged strategy to help guide future growth in the Valley.

Growth for the Future

Incentivizing Development inside the USB

As discussed, the current trend for residential housing in the Valley is not sustainable either environmentally or economically. The ongoing problems with much of the transportation system and groundwater quantity and quality have been discussed at length in previous chapters.

The costs of addressing these issues on a regional scale are daunting as studies such as the HAWT Facility Plan and the North Helena Valley Infrastructure Study have illustrated. For Lewis & Clark County, the most obvious solution to these problems is to encourage a large proportion of new residential development to be constructed using City of Helena water and sewer services and to ultimately be annexed into the City.

Unfortunately, there are financial incentives to continue building residential development in the Valley using infrastructure and services such as groundwater wells and septic systems. This motivation is likely due to the up-front capital cost differences between providing infrastructure to new housing in the County versus the cost of doing so in the City of Helena. Unless the County initiates change, it stands to reason that as long as it is less expensive to provide water and sewer infrastructure in the County, the majority of housing will continue to be built there.

In order to achieve the goal of promoting substantially more urban development in the Helena Valley, the County will need to implement a combination of educational, regulatory and financial mechanisms to help incentivize the construction of municipal infrastructure that will achieve a dramatic shift in the location of future housing and its provision of services. A more comprehensive discussion of Lewis &

Clark County's Integrated Approach to Growth Management is included in Chapter 3 of the Growth Policy Update.

Appendix A

- Itemized Opinions of Probable Cost
- Subdivision Layout Maps
- Maps of Included Utility Extensions
  (Adapted from a 2015 PER prepared by Morrison Maierle)

TABLE 1b
ITEMIZED OPINION OF PROBABLE COST
46 Degrees North Subdivision - County Standards

Item/ Group No.	Infrastructure Category/Description	Unit	Quantity	Price	Amount
A	***Road Corridor*** [1]				
1	Roadway Excavation & Embankment[2]	STA	84	$ 1,400.00	$ 117,600.00
3	3" Crushed Base Course	CY	2025	$ 33.00	$ 66,825.00
4	6" Select Base Course (Untreated)	CY	4360	$ 30.00	$ 130,800.00
5	4" Subbase Course Gravel (Assumed Average Thickness)	CY	3115	$ 18.00	$ 56,070.00
6	3" Hot Mix Asphalt	SY	22400	$ 15.50	$ 347,200.00
8	General Lot Earthwork and Finish Grading[2]	AC	48.6	$ 650.00	$ 31,590.00
7	Internal Traffic Signs	EA	13	$ 500.00	$ 6,500.00
9	Street Lighting & Electrical	EA	7	$ 5,500.00	$ 38,500.00
	Subtotal				***$ 795,085.00***
B	***Storm Water*** [1,3]				
1	Seeding of Ditches and Swales (Earthwork Figured in Group A)	LF	16800	$ 0.40	$ 6,720.00
2	Detention Pond Grading	CY	1500	$ 11.00	$ 16,500.00
3	Emergency Overflow	LS	1	$ 3,000.00	$ 3,000.00
4	18" Dia. HDPE Culvert (30' Long - Driveway)	LF	2880	$ 42.00	$ 120,960.00
5	32" Dia. CMP Cross Drain Culvert (Main Entrance)	LF	100	$ 90.00	$ 9,000.00
6	18 " Dia. CMP Cross Drain Culvert (Subdivision Roads 40' Long)	LF	280	$ 60.00	$ 16,800.00
7	CMP Flared End Sections	EA	14	$ 250.00	$ 3,500.00
8	Detention Pond Stabilization & Seeding	LS	1	$ 1,400.00	$ 1,400.00
	Subtotal				***$ 177,880.00***
C	***Sanitary Sewer*** [1]				
1	8" Dia. Gravity Sanitary Sewer Main (Internal Collection)	LF	7100	$ 60.00	$ 426,000.00
2	New Lift Station	LS	1	$ 150,000.00	$ 150,000.00
3	4" Dia. Force Main Piping (Waste Treatment System)	LF	1000	$ 25.00	$ 25,000.00
4	6" Dia. Effluent Line Piping (Waste Treatment System)	LF	70	$ 27.00	$ 1,890.00
5	4" Dia. Effluent Line Piping (Waste Treatment System)	LF	200	$ 25.00	$ 5,000.00
6	1.5" Dia. PVC Drainfield Lateral Piping (Waste Treatment System)	LF	5340	$ 15.00	$ 80,100.00
7	2" Dia. Force Main Piping for Waste Treatment System	LF	2100	$ 17.00	$ 35,700.00
8	4" Dia. Sanitary Sewer Service Line (Internal Collection)	LF	3250	$ 30.00	$ 97,500.00
9	Sanitary Sewer Service Connection (Internal Collection)	EA	92	$ 400.00	$ 36,800.00
10	New Sanitary Sewer Manhole (Size Varies)	EA	26	$ 4,500.00	$ 117,000.00
11	Level II Wastewater Treatment System (Including: recirculation tanks & equipment, tank access risers, pumps, controls, valving, piping, & recirculating sand filters)	LS	1	$ 408,000.00	$ 408,000.00
12	3,000 Gallon Dose Tank with Pumps and Controls	EA	2	$ 15,000.00	$ 30,000.00
13	30,000 Gallon Septic Tank	EA	2	$ 50,000.00	$ 100,000.00
14	Flow Meter and Vault	EA	2	$ 6,000.00	$ 12,000.00
15	Hydrotek (6403) Zone Valves with Enclosures	EA	4	$ 2,500.00	$ 10,000.00
16	Effluent Flow Splitting Manhole	EA	1	$ 10,000.00	$ 10,000.00
17	Chainlink Fence	LF	600	$ 32.00	$ 19,200.00
18	20' Double Panel Chain Link Gate	LS	1	$ 2,500.00	$ 2,500.00
19	Fittings	LS	1	$ 8,000.00	$ 8,000.00
20	Electrical & Backup Power	LS	1	$ 60,000.00	$ 60,000.00
	Subtotal				***$ 1,634,690.00***
D	***Water Supply*** [1]				
1	4" Dia. Water Main (for Shared Wells)	LF	1155	$ 46.00	$ 53,130.00
2	Drill 6" Dia. Well (Includes Casing)	LF	5680	$ 26.00	$ 147,680.00
3	Drill 10" Dia. Well (Includes Casing)	LF	400	$ 65.00	$ 26,000.00
4	Well Development/Pump Tests	HR	300	$ 100.00	$ 30,000.00
5	Well Completion	HR	300	$ 80.00	$ 24,000.00
6	4" 1/2 HP Pump (7 to 10 gpm), Pressure Tank & Controls	EA	71	$ 2,350.00	$ 166,850.00
7	5 HP Variable Frequency, Constant Pressure Pump, Controls & Electrical	EA	2	$ 16,000.00	$ 32,000.00
8	Pump House for Shared Wells	EA	2	$ 38,000.00	$ 76,000.00
9	Pump Electrical Service & Wiring for 6" Dia. Wells	EA	71	$ 1,100.00	$ 78,100.00
10	3/4" Residential Water Service Line	LF	8800	$ 22.00	$ 193,600.00
11	1" Commercial Water Service Line	LF	800	$ 24.00	$ 19,200.00
	Subtotal				***$ 846,560.00***
E	***Fire Protection***				
1	Drill 8" Fire Protection Well(s)	LF	800	$ 45.00	$ 36,000.00
2	8" Dia. Fire Main	LF	500	$ 50.00	$ 25,000.00
3	Well Casing & Screen	LF	600	$ 28.00	$ 16,800.00
4	Well Development/Pump Tests	HR	30	$ 100.00	$ 3,000.00
5	Well Completion	HR	8	$ 100.00	$ 800.00
6	5 HP Variable Frequency, Constant Pressure Pump, Controls & Electrical	EA	2	$ 17,500.00	$ 35,000.00
7	Pump House for Fire Wells	EA	2	$ 35,000.00	$ 70,000.00
8	Pump House Piping and Appurtenances	LS	1	$ 30,000.00	$ 30,000.00
9	6" Fire Hydrant with Auxiliary Gate Valve	EA	3	$ 5,000.00	$ 15,000.00
	Subtotal				***$ 231,600.00***
F	***Professional Services***				
1	Survey, Design, Permitting, Plat, Construction Documentation, & Etc. Fees	LS	1	$ 740,000.00	$ 740,000.00
	Subtotal				***$ 740,000.00***
TOTAL CONSTRUCTION					**$ 4,425,815.00**

Assumptions:

1. All subdivision design, including wastewater treatment & collection, road layout, storm drainage, water distribution, etc. performed by Heller Development, LLC as part of a May 2014 Preliminary Plat Package submitted to Lewis & Clark County. Quantities for this economic analysis have been approximated from information & data contained within a hardcopy of the original Plat Submittal.

2. Earthwork quantities assumed to be balanced (no fill import or cut export).

3. Lewis & Clark County's conditional approval of the subdivision included a stipulation requiring the developer to install curb & gutter along roadways. However, as this estimate is based upon the Developer's initial Plat Submittal and design (including ditches, swales, culverts, etc. for stormwater management), curb & gutter was not included in this analysis.

TABLE 2c
ITEMIZED OPINION OF PROBABLE COST
46 Degrees North Subdivision - City of Helena Annexable

Item/ Group No.	Infrastructure Category/Description	Unit	Quantity	Price	Amount
A	***Road Corridor*** [1]				
1	Road Excavation & Embankment[2]	STA	100	$ 2,500.00	$ 250,000.00
2	Alley Earthwork	STA	12	$ 900.00	$ 10,800.00
3	3" Crushed Base Course	CY	3150	$ 33.00	$ 103,950.00
4	6" Select Base Course (Untreated)	CY	6745	$ 30.00	$ 202,350.00
5	4" Subbase Course Gravel (Assumed Average Thickness)	CY	4200	$ 18.00	$ 75,600.00
6	3" Hot Mix Asphalt	SY	34940	$ 14.00	$ 489,160.00
7	4" Concrete Sidewalk	SY	8340	$ 65.00	$ 542,100.00
8	6" Concrete Sidewalk	SY	2780	$ 71.00	$ 197,380.00
9	General Lot Earthwork and Finish Grading[2]	AC	46.4	$ 1,100.00	$ 51,040.00
10	Internal Traffic Signs	EA	15	$ 500.00	$ 7,500.00
11	Street Lighting & Electrical	EA	80	$ 5,500.00	$ 440,000.00
12	Paint Street Markings	LS	1	$ 6,000.00	$ 6,000.00
13	Standard Concrete Curb & Gutter	LF	20000	$ 19.50	$ 390,000.00
14	Boulevard Trees & Irrigation	EA	400	$ 410.00	$ 164,000.00
	Subtotal				***$ 2,929,880.00***
B	***Storm Water*** [1]				
1	12" RCP Storm Drain	LF	4025	$ 50.00	$ 201,250.00
2	15" RCP Storm Drain	LF	6220	$ 58.00	$ 360,760.00
3	18" RCP Storm Drain	LF	965	$ 60.00	$ 57,900.00
4	24" RCP Storm Drain	LF	1160	$ 80.00	$ 92,800.00
5	36" RCP Storm Drain	LF	45	$ 140.00	$ 6,300.00
6	15" RCP Flared End Section	EA	3	$ 350.00	$ 1,050.00
7	24" RCP Flared End Section	EA	1	$ 480.00	$ 480.00
8	36" RCP Flared End Section	EA	1	$ 840.00	$ 840.00
9	48" Dia. Storm Manhole	EA	59	$ 3,000.00	$ 177,000.00
10	60" Dia. Storm Manhole	EA	2	$ 4,800.00	$ 9,600.00
11	72" Dia. Storm Manhole	EA	1	$ 5,400.00	$ 5,400.00
12	Curb Inlet	EA	120	$ 2,400.00	$ 288,000.00
13	Catch Basin	EA	12	$ 1,900.00	$ 22,800.00
14	Detention Pond Outlet Structure	LS	1	$ 6,000.00	$ 6,000.00
15	Detention Pond Grading	CY	8200	$ 8.00	$ 65,600.00
16	Emergency Overflow	LS	1	$ 3,000.00	$ 3,000.00
17	32" Dia. CMP Cross Drain Culvert (Main Entrance)	LF	100	$ 90.00	$ 9,000.00
18	Detention Pond Stabilization & Seeding	LS	1	$ 3,500.00	$ 3,500.00
	Subtotal				***$ 1,311,280.00***
C	***Sanitary Sewer*** [1,3,4]				
1	City Sewer Connection Development Fee	LS	1	$ 203,000.00	$ 203,000.00
2	8" Dia. Gravity Sanitary Sewer Main (Internal Collection)	LF	5160	$ 40.00	$ 206,400.00
3	12" Dia. Gravity Sanitary Sewer Main (Internal Collection)	LF	2565	$ 60.00	$ 153,900.00
4	18" Dia. Gravity Sanitary Sewer Main (Internal Collection)	LF	950	$ 100.00	$ 95,000.00
5	12" Dia. Gravity Sanitary Sewer Main (Extension)[5]	LF	810	$ 60.00	$ 48,600.00
6	10" Dia. Force Main (Internal - from New Lift Station to Development Extents)	LF	1040	$ 60.00	$ 62,400.00
7	10" Dia. Force Main (Extension - from Subdivision Boundary to Custer Ave.)[5]	LF	4210	$ 60.00	$ 252,600.00
8	HVID Crossing, Opencut with Trench Plugs[5]	EA	1	$ 30,000.00	$ 30,000.00
9	New Sanitary Sewer Manhole (Size Varies)	EA	27	$ 5,500.00	$ 148,500.00
10	4" Dia. Sanitary Sewer Service Line (Internal Collection)	LF	6480	$ 30.00	$ 194,400.00
11	Sanitary Sewer Service Connection (Internal Collection)	EA	162	$ 400.00	$ 64,800.00
12	North Side Lift Station (Internal Collection - inc. Backup Power, Controls, etc.)	LS	1	$ 942,000.00	$ 942,000.00
13	Construction Connection to City Sewer[5]	EA	1	$ 5,000.00	$ 5,000.00
14	Street Cut & Pavement Repair along Montana Avenue[6]	SF	10100	$ 7.50	$ 75,750.00
15	Remove & Replace Curb & Gutter	LF	750	$ 30.00	$ 22,500.00
16	Vegetative Surface Restoration along Force Main[5]	LS	1	$ 4,200.00	$ 4,200.00
17	Traffic Control	LS	1	$ 12,000.00	$ 12,000.00
	Subtotal				***$ 2,521,050.00***
D	***Water Supply*** [1,3,4]				
1	City Water Connection Development Fee & Water Meter Supply	LS	1	$ 203,500.00	$ 203,500.00
2	20" Water Main (Interior Distribution) along N. Montana Avenue	LF	930	$ 150.00	$ 139,500.00
3	20" Water Main (Extension) along N. Montana Avenue[5]	LF	2025	$ 150.00	$ 303,750.00
4	12" Water Main (Extension) from Lowes[5]	LF	2950	$ 70.00	$ 206,500.00
5	12" Water Main (Interior Distribution)	LF	6020	$ 70.00	$ 421,400.00
6	8" Dia. Water Main (Interior Distribution)	LF	4590	$ 50.00	$ 229,500.00
7	20" Butterfly Valve	EA	6	$ 7,500.00	$ 45,000.00
8	20" Fittings	EA	10	$ 2,500.00	$ 25,000.00
9	Connection to Existing 20" Main (Extension)[5]	EA	1	$ 4,000.00	$ 4,000.00
10	12" Gate Valve with Box	EA	15	$ 4,000.00	$ 60,000.00
11	8" Gate Valve with Box	EA	16	$ 2,500.00	$ 40,000.00
12	8" and 12" Fittings	EA	30	$ 1,125.00	$ 33,750.00
13	Connection to Existing 12" Main (Extension)[5]	EA	1	$ 2,500.00	$ 2,500.00
14	HVID Crossing, 20" Jack and Bore under Lined Canal & Montana Avenue[5]	LF	200	$ 500.00	$ 100,000.00
15	HVID Crossing, Opencut with Trench Plugs	EA	1	$ 30,000.00	$ 30,000.00
16	Water Service Connections (Saddle, Corp. Stop, Curb Valve & Box)	EA	162	$ 1,500.00	$ 243,000.00
17	1" Dia. Water Service Line	LF	6480	$ 24.00	$ 155,520.00
18	Install Interior Water Meter	EA	162	$ 250.00	$ 40,500.00
19	Utility Relocations[5,6]	EA	5	$ 5,000.00	$ 25,000.00
20	Utility Crossings[5,6]	EA	5	$ 1,000.00	$ 5,000.00
21	Access Road Crossings[5]	EA	2	$ 2,000.00	$ 4,000.00
22	Traffic Control[5,6]	LS	1	$ 30,000.00	$ 30,000.00
	Subtotal				***$ 2,347,420.00***
E	***Fire Protection***				
1	6" Fire Hydrant with Auxiliary Gate Valve	EA	54	$ 7,500.00	$ 405,000.00
	Subtotal				***$ 405,000.00***
F	***Professional Services***				
1	Survey, Design, Permitting, Plat, Construction Documentation, & Etc. Fees[5,6]	LS	1	$ 1,720,000.00	$ 1,720,000.00
	Subtotal				***$ 1,720,000.00***
TOTAL CONSTRUCTION (Including Public Utility Extensions)					**$ 11,234,630.00**

Assumptions:

1. Heller Development, LLC created an alternate high-density concept of the development in response to Lewis & Clark County's 'Conditions of Approval Letter' (dated March 26, 2015) for the original Preliminary Plat Submittal. Approximate quantities for this economic analysis have been scaled from a layout for the alternate urban-density variant of the proposed development. Where appropriate, modifications have been made to the Developer's alternate concept in order to allow for future annexation by the City of Helena.

2. Earthwork quantities assumed to be balanced (no fill import or cut export).

3. City Water & Sewer Main extension pricing & quantities based upon data from a 2015 Preliminary Engineering Study by Morrison Maierle.

4. Water Mains consist of Cement Lined Ductile Iron. Sewer Mains consist of SDR PVC.

5. The County may consider helping to fund external utility extension work through interlocal agreements & a Water & Sewer District(s).

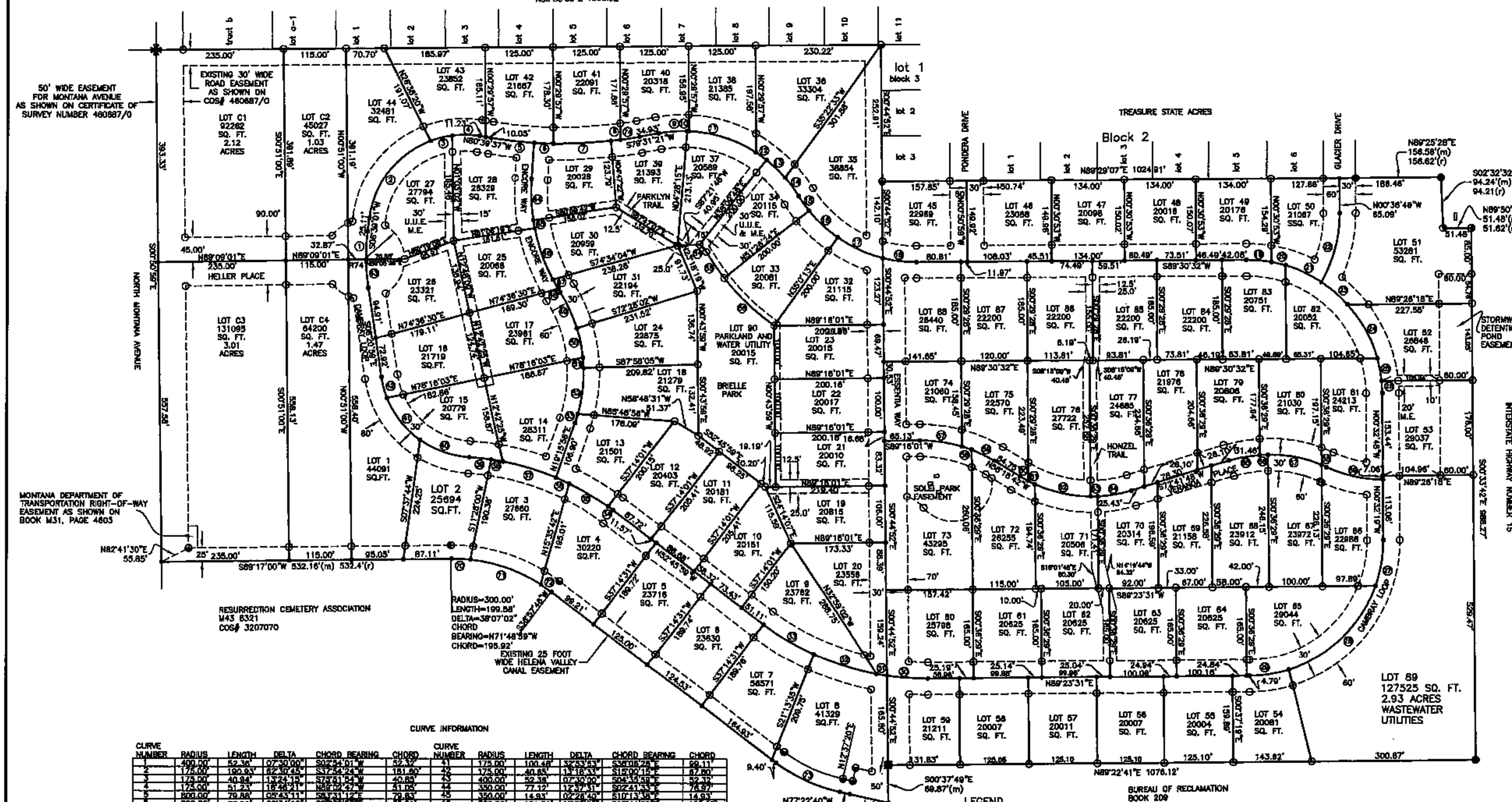
6. If assistance is offered by the County, only a portion of this work is anticipated to funded by a Water & Sewer District(s).

7. This City variant includes only the infrastructure identified in Morrison Maierle's PER that would be necessary to provide technically feasible utilities to the subdivision, all meeting City Standards. Other peripheral infrastructure, as discussed in the PER, was not included.

Original Plat Submittal

46 NORTH MAJOR SUBDIVISION

A 94 LOT MAJOR SUBDIVISION OF THAT TRACT AS SHOWN ON CERTIFICATE OF SURVEY NUMBER 460687/0 AND TRACT D AS SHOWN ON CERTIFICATE OF SURVEY NUMBER 428391/0, BEING IN THE NORTHWEST QUARTER OF SECTION 17, TOWNSHIP 10 NORTH, RANGE 3 WEST OF THE PRINCIPAL MERIDIAN, MONTANA, LEWIS AND CLARK COUNTY, MONTANA.
SURVEY PERFORMED FOR: HELLER DEVELOPMENT, LLC



CURVE INFORMATION

CURVE NUMBER	RADIUS	LENGTH	DELTA	CHORD BEARING	CHORD	CURVE NUMBER	RADIUS	LENGTH	DELTA	CHORD BEARING	CHORD
1	400.00'	52.36'	07°30'00"	S02°54'01"W	52.32'	41	175.00'	100.48'	32°53'53"	S36°06'25"E	99.11'
2	175.00'	190.93'	62°30'45"	S37°54'24"W	181.60'	42	175.00'	40.65'	13°18'33"	S15°00'15"E	87.60'
3	175.00'	40.84'	13°24'15"	S75°51'54"W	40.65'	43	400.00'	52.36'	07°30'00"	S04°35'59"E	52.32'
4	175.00'	51.23'	16°46'21"	N88°02'47"W	51.05'	44	350.00'	77.12'	12°37'31"	S02°41'33"E	76.97'
5	800.00'	79.86'	05°43'11"	S83°31'12"E	79.83'	45	350.00'	14.93'	02°26'40"	S10°13'38"E	14.93'
6	800.00'	35.91'	02°34'19"	S87°39'57"E	35.91'	46	350.00'	101.31'	16°35'03"	S18°44'30"E	100.95'
7	800.00'	107.51'	07°42'00"	N87°11'53"E	107.43'	47	350.00'	19.58'	03°12'21"	S29°38'12"E	19.58'
8	800.00'	17.78'	01°16'24"	N82°42'41"E	17.78'	48	350.00'	8.32'	01°21'43"	S31°55'14"E	87.60'
9	250.00'	52.32'	11°59'28"	S85°31'05"W	52.23'	49	280.00'	73.64'	15°04'08"	N25°06'02"W	73.43'
10	250.00'	3.28'	00°45'07"	N89°08'47"W	3.28'	50	280.00'	56.36'	11°31'58"	N13°45'50"W	56.26'
11	250.00'	133.00'	30°28'54"	N72°24'36"W	131.44'	51	280.00'	19.39'	03°58'05"	N04°00'57"W	19.39'
12	250.00'	23.83'	05°24'43"	N56°32'40"W	23.82'	52	280.00'	86.31'	17°39'45"	N06°47'57"E	85.97'
13	250.00'	47.70'	10°55'58"	N48°22'13"W	47.63'	53	280.00'	17.77'	03°38'09"	N17°28'53"E	17.77'
14	250.00'	43.14'	09°53'09"	N38°57'39"W	43.08'	54	50.00'	18.17'	20°49'07"	N41°25'35"W	18.07'
15	250.00'	32.91'	07°32'31"	S34°47'20"E	32.88'	55	450.00'	59.23'	07°32'31"	S34°47'20"E	59.19'
16	250.00'	71.72'	16°26'11"	S46°46'41"E	71.47'	56	450.00'	129.09'	16°26'11"	S46°46'41"E	128.65'
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

LEGEND

- ○ SET A 5/8" REBAR WITH A YELLOW PLASTIC CAP BY DENGEL 14733LS
- ● FOUND A 5/8" DIAMETER REBAR WITH A YELLOW PLASTIC CAP BY BUCHER 4548S
- ■ FOUND A 5/8" DIAMETER REBAR WITH AN ALUMINUM CAP BY BUCHER 4548S
- FOUND A 5/8" DIAMETER REBAR WITH A YELLOW PLASTIC CAP BY TANGEN 3368ES
- FOUND A 5/8" DIAMETER REBAR BY MORRISON-MAIERLE
- FOUND A 5/8" DIAMETER REBAR
- SECTION CORNER AS NOTED
- ○ COMPUTATION POINT – NOTHING FOUND OR SET

U.U.E. UNDERGROUND UTILITY EASEMENT
M.E. MAINTENANCE EASEMENT
W.U.E. WATER UTILITY EASEMENT
(m) MEASURED DATA THIS SURVEY
(r) RECORD DATA AS PER C.O.S. No.460687/0 AND 428391/0

SURVEYOR'S NOTE:

HELLER PLACE IS DESIGNATED 90 FOOT WIDE PUBLIC ACCESS AND UNDERGROUND UTILITY EASEMENT.
CAMBRAY LOOP, ENCORE WAY, VERANDA PLACE, PONDERA DRIVE AND GLACIER DRIVE ARE ALL DESIGNATED 60 FOOT WIDE PUBLIC ACCESS AND UNDERGROUND UTILITY EASEMENTS.
ESSENTIA WAY IS DESIGNATED 70 FOOT WIDE PUBLIC ACCESS AND UNDERGROUND UTILITY EASEMENT.

CERTIFICATE OF DEDICATION

We hereby certify that we have caused to be surveyed and subdivided into lots and roads, the following described tract of land:

A tract of land located in the Northwest Quarter of Section 17, Township 10 North, Range 3 West of the Principal Meridian, Montana, Lewis and Clark County, Montana, being That Tract as shown on Certificate of Survey number 460687/O and Tract D as shown on Certificate of Survey number 428391/O and more particularly described as follows:

Beginning at the Northwest corner of Section 17 (a point on the centerline of North Montana Avenue referenced by a survey pin which bears N89°30'03"E a distance of 60 feet);
Thence leaving said centerline along the north line of Section 17 N89°30'03"E a distance of 1338.32 feet to a survey pin at the West sixteenth corner;
Thence leaving said north line S00°44'52"E a distance of 252.81 feet to a survey pin;
Thence N89°29'07"E a distance of 1024.91 feet to a survey pin;
Thence S02°32'32"E a distance of 94.24 feet to a survey pin;
Thence N89°50'23"E a distance of 51.48 feet to a survey pin on the westerly right-of-way line of Interstate Highway Number 15;
Thence along said westerly line S00°37'42"E a distance of 988.27 feet to survey pin;
Thence leaving said westerly line S89°22'41"W a distance of 1078.12 feet to a survey pin at the Northwest sixteenth corner;
Thence S00°37'49"E a distance of 89.87 feet to a point on the centerline of the Helena Valley Canal referenced by a survey pin which bears N00°37'49"W a distance of 69.87 feet;
Thence along said centerline the following six courses; N77°22'40"W a distance of 73.44 feet; N77°22'40"W a distance of 18.72 feet; Thence along a curve to the right with a radial bearing of N12°37'20"E, a radius of 300.00 feet and a length of 128.87 feet; Thence N52°45'29"W a distance of 523.18 feet; Thence along a curve to the left with a radial bearing of S38°57'46"W, a radius of 300.00 feet and a length of 199.58 feet;
Thence S89°17'00"W a distance of 532.16 feet to a point on the centerline of North Montana Avenue referenced by a survey pin which bears N 62°41'30"E a distance of 55.85';
Thence along said centerline N00°50'58"W a distance of 950.81 feet to the point at the point of beginning. These lots contain 60.02 acres subject to and together with all appurtenant easements of record.

UNDERGROUND UTILITY EASEMENT

We hereby grant unto each and every person, firm or corporation, whether public or private, providing or offering to provide telephone, telegraph, electric power, gas, cable television, water or sewer service to the public, the right to the joint use of their lines and other facilities, under each area designated on this plat as "Underground Utility Easement" to have and to hold forever.

Parker Heller

Julie Lamb Heller

BASIS OF BEARINGS:
CERTIFICATE OF SURVEY NUMBER 460687/0

CERTIFICATE OF EXAMINING LAND SURVEYOR
REVIEWED FOR ERRORS AND OMISSIONS IN CALCULATIONS AND DRAFTING THIS ____ DAY OF ________, 20__
PURSUANT TO SECTION 76-3-611 (2)(a), MCA.

EXAMINING LAND SURVEYOR
LICENSE NO. ________

Ownership Information:
Deeds recorded in Misc. Book 47 on Page 6136 of the Lewis and Clark County, Montana records.

CERTIFICATE OF SURVEYOR
I, DANIEL E. DENGEL, A LICENSED PROFESSIONAL LAND SURVEYOR IN THE STATE OF MONTANA, DO HEREBY CERTIFY THAT THIS IS A TRUE REPRESENTATION OF A SURVEY MADE UNDER MY DIRECT SUPERVISION.

DANIEL E. DENGEL, MONTANA REG. NO. 14733LS

DENGEL SURVEYING
HELENA, MONTANA

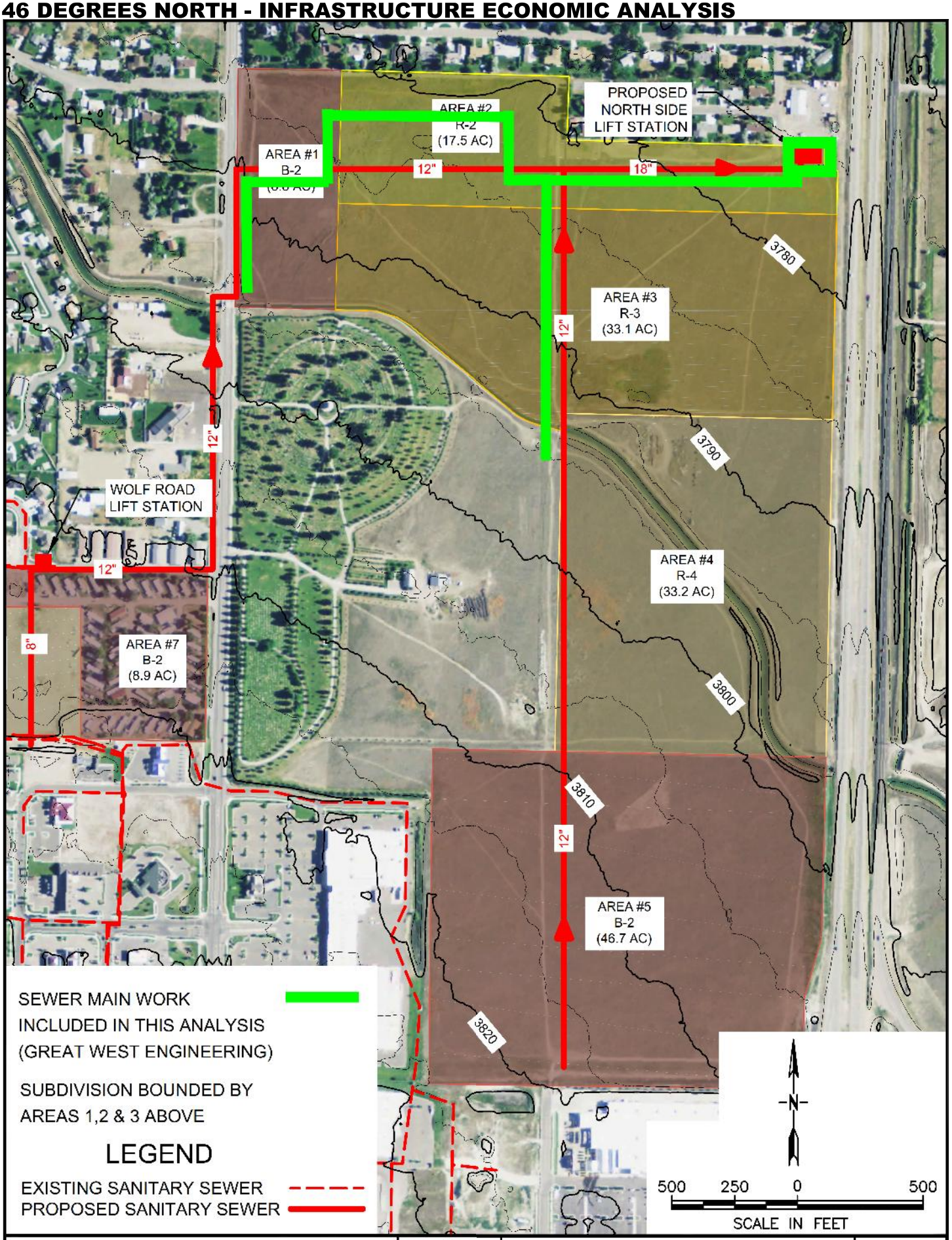
Scale: 0 50 100 200

1/4	Sec.	T.	R.
NW	17	10N	3W

Date: April 29, 2014
County: Lewis & Clark, P.M., M. Job No.: 201432

Alternate High-Density Concept

46 DEGREES NORTH - INFRASTRUCTURE ECONOMIC ANALYSIS



MORRISON MAIERLE, INC.
An Employee-Owned Company
Engineers
Surveyors
Scientists
Planners
1 Engineering Place
Helena, MT 59602
Phone: (406) 442-3050
Fax: (406) 442-7862

DRAWN BY: JAC
DSGN. BY: NDL
APPR. BY: JMA
DATE: 03/2015

HELENA NORTH SIDE DEVELOPMENT
HELENA MONTANA

PROJECT NO. 0500.154

GRAVITY SEWER TRUNK MAIN LAYOUT

FIGURE NUMBER
FIG. 2

R:\0500\154 - North Side Lift Station\ACAD\EXHIBITS\FIG-2.dwg Plotted by:dhallsten on Mar/17/2015

46 DEGREES NORTH - INFRASTRUCTURE ECONOMIC ANALYSIS

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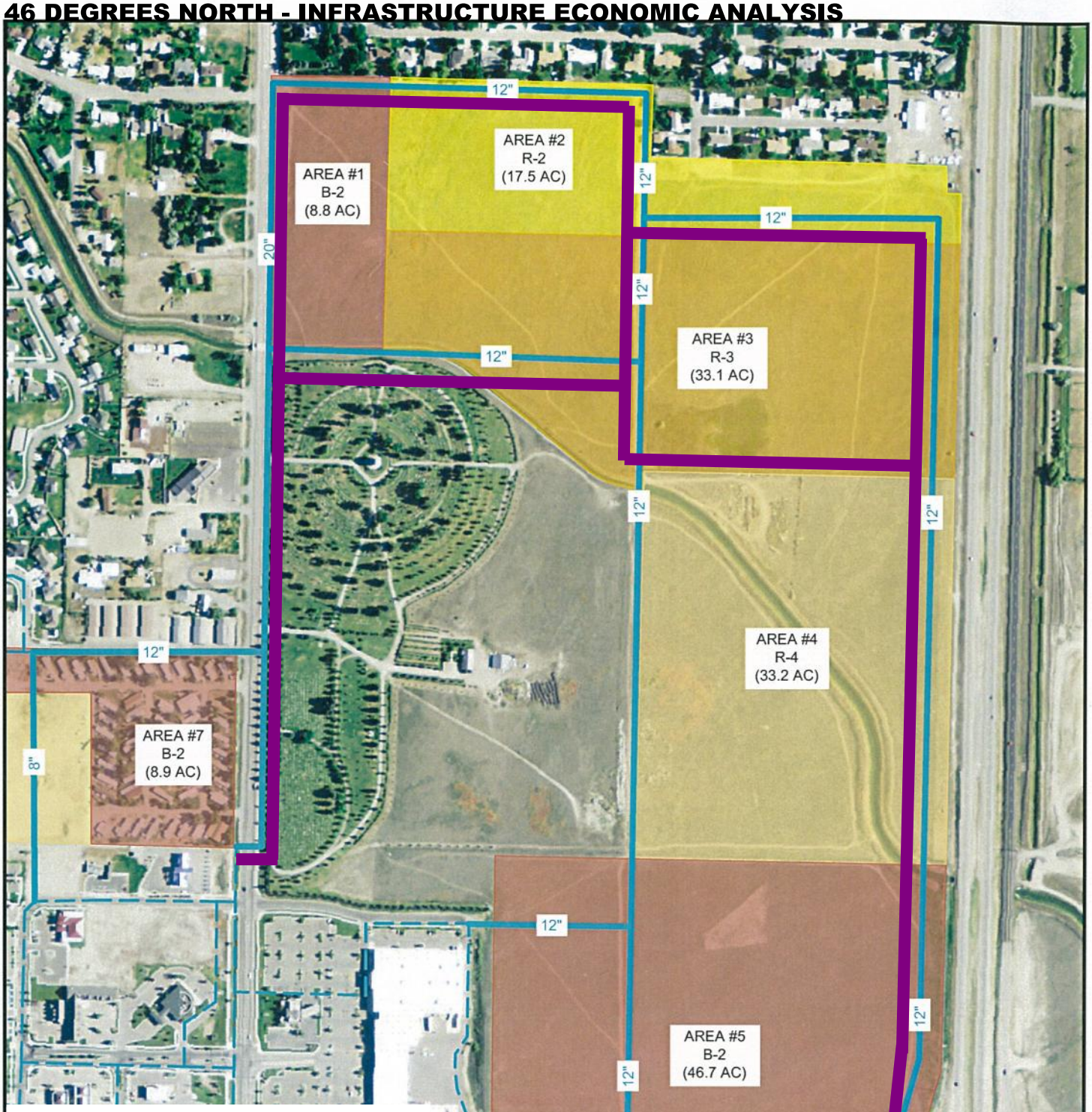
HELENA NORTHSIDE DEVELOPMENT
HELENA MONTANA

PROJECT NO. 0500.154

FORCE MAIN OPTIONS

FIGURE NUMBER FIG. 3

R:\0500\154 - North Side Lift Station\ACAD\EXHIBITS\FIG-3.dwg Plotted by:dhallsten on Mar/17/2015



WATER MAIN WORK
INCLUDED IN THIS ANALYSIS
(GREAT WEST ENGINEERING)

SUBDIVISION BOUNDED BY
AREAS 1,2 & 3 ABOVE

LEGEND

EXISTING WATER MAIN
PROPOSED WATER MAIN

MORRISON MAIERLE, INC.
An Employee-Owned Company
Engineers
Surveyors
Scientists
Planners
1 Engineering Place
Helena, MT 59602
Phone: (406) 442-3050
Fax: (406) 442-7862

DRAWN BY: JAC
DSGN. BY: NDL
APPR. BY: JMA
DATE: 03/2015

HELENA NORTHSIDE DEVELOPMENT
HELENA MONTANA

PROJECT NO. 0500.154

WATER MAIN LAYOUT

FIGURE NUMBER
FIG. 4

R:\0500\154 - North Side Lift Station\ACAD\EXHIBITS\FIG-4.dwg Plotted by:jchambers on Mar/23/2015