AgriVia

PO Box 44
1124 Willis Ave
Perry, IA 50220

Engineer's Report

Drainage District No. 61
Downstream Outlet Improvements

Palo Alto County, Iowa
2025

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Jacob Hagan 9/16/25

Jacob L. Hagan, P.E. (date)
License No. 25738
My license renewal date is December 31, 2026.
Pages or sheets covered by this seal:

All

Project No. 2517-74

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Introduction

Overview
Under Iowa Code Chapter 468, landowners have the right to petition for repairs or improvements to a drainage district when they believe work is needed. On August 20, 2024, a landowner submitted a formal petition to the Palo Alto County Board of Supervisors, who serve as trustees for Drainage District No. 61. The petition requested three items: cleaning out the bridge at 475th Street, installing two 72-inch culverts, and making improvements downstream of the drainage district outlet (see Appendix A).

Upon receiving a valid petition, state law requires the Board to hire a licensed engineer for a preliminary report evaluating needs and estimated costs. The Board appointed AgriVia to prepare this report on August 26, 2025. The purpose of the report is to inform landowners, provide background, and guide discussion before any decisions are made. Because the petition specifically focused on the downstream outlet, this report only addresses that portion of the system. The upstream open ditch was improved within the last five years and is not part of this evaluation.

Location
Drainage District No. 61 serves approximately 35,000 acres in Palo Alto and Kossuth Counties, including parts of West Bend and Rodman. Maps of the DD 61 benefitted area are on file with the Auditor's Office.

This study focuses on the creek immediately downstream of the district, located in the south half of Section 13 and the north half of Section 24, between 475th Street and 485th Street, about ¼ mile west of West Bend. This highly meandering stretch of creek flows roughly 10,300 linear feet over a one-mile straight-line distance. A map of the area of study is included in Appendix B.

Historical Considerations

Downstream Outlet Improvements
Engineer's Reports from 2016 and 2017, along with several amendments, are on file with the Auditor's Office. Specifically, Amendment Nos. 1, 3, and 4 of the 2017 report proposed improvements to the outlet downstream of DD 61 as part of a larger overall project.

The proposed improvements included installing additional culverts under 475th Street, constructing a high overflow channel, and cleaning out the downstream outlet to 485th Street. While the upstream improvements were completed, the downstream outlet improvements were not implemented.

In 2024, Bolton and Menk submitted a letter outlining a scaled-back approach to clean out the downstream outlet for 46 stations. The letter is also on file with the Auditor's Office.

Environmental Considerations

Flooding and Subsurface Drainage
Subsurface drainage, while primarily installed to improve agronomic performance and soil workability, also plays a role in broader hydrological outcomes. A 2014 study conducted by the University of Iowa's IIHR—Hydroscience & Engineering Institute concluded that modern subsurface tile drainage systems can reduce peak flow rates during storm events. By gradually drawing down the water table and drying out soils, tile systems allow the soil to soak in more rainfall and delay the timing of runoff compared to surface flow, thereby attenuating flood peaks in receiving streams. This contradicts the common theory that tile drainage always increases flood risk.

Nutrient Loading and Subsurface Drainage
DD 61 lies in the Des Moines River watershed, where tile drainage supports row crops on heavy, poorly drained soils by removing excess water. However, tiles create direct paths for soluble nutrients, especially nitrate-nitrogen (NO_3^--N), to reach streams. Long-term monitoring by the Iowa DNR and USGS shows elevated nitrate levels in the Des Moines River during high tile flow periods. Tile drainage does not create nutrients but accelerates their movement, making nutrient management and conservation practices essential alongside drainage improvements to reduce nutrient loading and protect water quality.

Existing Infrastructure and Conditions

Field Survey
The initial field survey of Drainage District No. 61 was completed in September 2025. As part of this effort, a video drone was flown over the creek to document current conditions. High-accuracy GPS equipment was used to collect flowline elevation data at the road crossings on 475th Street and 485th Street. The channel bottom at 475th Street consists of muddy silt, while at 485th Street it transitions to a gravelly sand substrate. No additional survey points were taken between these two crossings. The measured grade between the two locations was approximately 0.03%, which closely aligns with the grade reported in the 2017 Engineer's Report.

The drone footage was used to assess the condition of the downstream outlet creek. The channel is heavily wooded, with dense stands of shrubs and small trees along much of its length. The banks are steep, nearly vertical in places, and the creek follows a meandering path with numerous sharp bends. A drone photo of the heavily wooded downstream creek is shown on the next page, additional photos are included in Appendix C. The heavily wooded condition is in contrast to the historical photos from the 1930's and 1980's showing few trees along the banks (Appendix D).

To supplement the survey, LiDAR (Light Detection and Ranging) was used to map the surface topography near the creek. This remote sensing technology uses laser pulses from aircraft to generate high-resolution elevation data. The resulting map reveals that the downstream creek lies significantly lower than the town of West Bend, with elevations near the creek around 1,150 feet and the town rising to approximately 1,200 feet. This elevation map is provided in Appendix E.

Although LiDAR is generally highly accurate, its reliability decreases in areas with dense tree cover. As a result, a full ground-based topographic survey will be required before any proposed cleaning or regrading of the creek can be undertaken.

Proposed Project

Project Design

The upstream open ditch in Drainage District No. 61 was recently improved and now meets the design standard for a 2-year, 48-hour storm event. This is considered the modern benchmark for agricultural drainage systems. That improved section features a 50-foot bottom width, 2:1 side slopes, and can carry approximately 710 cubic feet per second (cfs) of water.

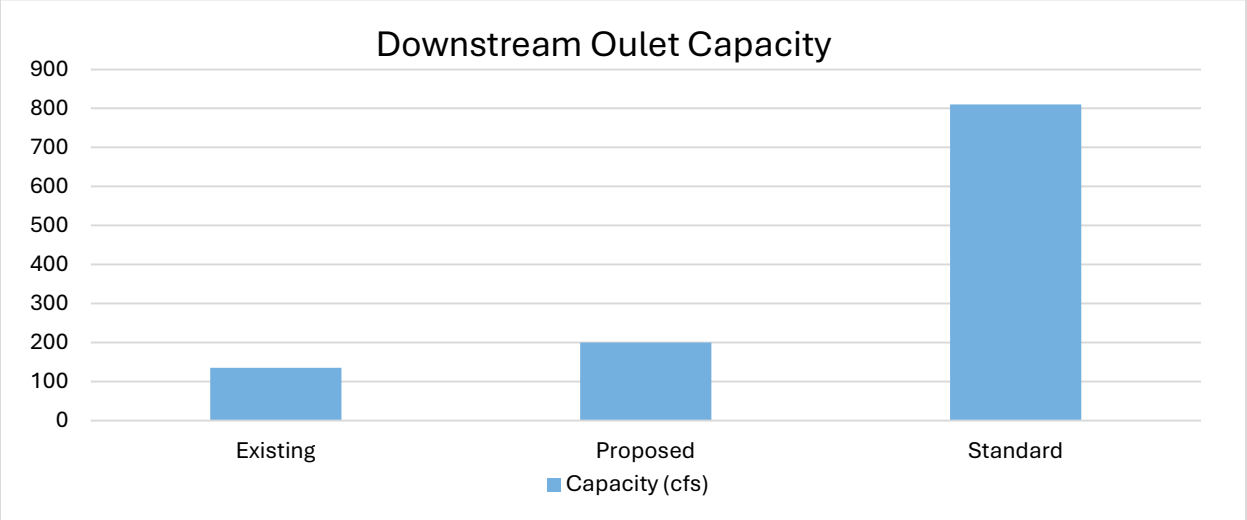
In contrast, the downstream creek, where this report is focused, is much narrower and steeper. It averages only 20 feet in bottom width, has 1:1 side slopes or steeper, and features a flatter slope overall. In its current condition, the downstream creek is estimated to carry only about 135 cfs, based on the Manning's Uniform Flow Equation. Its lower capacity is due to several limiting factors, including its narrow shape, poor alignment with sharp bends, dense vegetation, and contributions of runoff from Drainage District No. 3, which joins the creek about ¼ mile downstream of 475th Street.

An option to improve this downstream reach was included in the 2017 Engineer's Report, and while that design is not being recommended in this report, it remains a valid alternative that landowners could choose to pursue in the future. However, bringing this section up to the full design standard would involve substantial construction and permitting costs.

Instead, we propose a more limited improvement based on the conceptual approach outlined in the 2024 design letter. This approach focuses on improving the existing creek's ability to carry water by reducing resistance to flow, primarily through cleaning and minor reshaping. By removing vegetation, debris, and irregularities from the channel and pulling the banks back to a 2:1 side slope, flow can be increased even without widening the bottom. These changes are expected to raise the flow capacity to approximately 200 cfs. This is about 50% more than current conditions, but still far below the 710 cfs capacity of the upstream ditch.

Existing Typical Cross Section	Proposed Typical Cross Section
	

The petition also requested cleaning the bridge at 475th Street and installing two 72-inch culverts. This bridge was evaluated in Amendment No. 1 to the 2017 Engineer's Report, which considered the addition of culverts but ultimately did not recommend it due to the high cost and limited benefit to the overall system. While we acknowledge that the bridge and the downstream reach remain undersized, we recommend a more modest improvements that will offer some drainage relief without triggering major permitting or construction requirements. A chart showing the existing, proposed, and a standard agricultural ditch capacity is shown below.



Proposed Work

The proposed construction work consists of four key activities:

- **Tree Clearing**
  The ditch banks along the 9,400 feet long project route are heavily wooded in several areas. This tree growth inhibits the establishment of grass vegetation, which is necessary to stabilize the soil. Additionally, trees contribute woody debris that can obstruct flow and serve as material for beaver dams. Dense vegetation also limits access for future inspection and maintenance. To address these issues, all trees within 50 feet of each side of the creek will be cleared. This will allow sunlight to reach the banks, promoting grass growth, and will provide a clear access path along the creek. All cleared trees will be burned and buried in the designated areas shown on the construction plans.

- **Channel Cleanout**
  Cleaning accumulated silt, debris, and obstructions from the ditch will restore flow capacity and hydraulic function. The existing grade is extremely flat, so even minor obstructions, such as islands, sandbars, or debris-induced meanders can eliminate positive grade and impair drainage. The cleanout will remove these obstructions and minor debris-induced meanders from the creek bottom to improve flow efficiency.

- **Bank Stabilization**
  The existing creek banks are nearly vertical and unstable, making them prone to sloughing and bank failure. The proposed work will regrade these banks to a stable 2:1 slope, allowing for improved vegetative cover and long-term stability. Banks will be seeded daily during construction with a temporary cover crop, and a permanent seed mix will be applied at the conclusion of the project. Due to the sensitivity of seeding operations to weather conditions, successful establishment may vary, and re-seeding may be necessary in some areas.

- **Spoil Management (Spoil Leveling)**
  Excavated material from the channel cleanout and bank reshaping will be placed and shaped along the top of the banks. The spoil will be leveled, tilled, and cleared of rocks and debris. A temporary cover crop seed mix will be applied, but responsibility for final permanent seeding will rest with the individual landowners. This approach minimizes hauling costs while providing erosion protection and useful areas for landowners.

Preliminary Plans

The preliminary construction plans are enclosed with this report and provide additional detail regarding the proposed improvement. These plans serve as a guide for the contractor and outline the expectations and standards for construction. Included in the plans are the proposed tree clearing area, work limits, construction details, and the specific work anticipated to take place on each landowner's property. The plans also contain profile views showing the proposed depth of the creek. While these plans are considered preliminary and may be refined prior to final bidding, they provide landowners with a clear understanding of the proposed scope of work.

Estimated Costs

Cost Estimate
The total estimated cost for all proposed work is $405,000. This figure includes all anticipated construction activities, right-of-way needs, engineering services, and administrative expenses. The breakdown is as follows:

Activity	Cost
Phase 1 Construction- Tree Clearing	$66,000
Phase 2 Construction- Cleanout and Bank Stabilization	$166,000
Construction Contingency	$23,000
Right-of-Way and Construction Damages	$60,000
Engineering	$55,000
Other Expenses (Legal, Administrative, and Interest)	$35,000

This is a preliminary engineer's estimate, prepared for planning purposes. Costs are based on recent bid tab data from comparable projects and include allowances for contingency and administrative expenses. Final construction costs will depend on market conditions at the time of bidding and may vary from this estimate.

A detailed itemization of costs is provided in Appendix F.

Assessment Schedule Review
Individual assessments will be determined based on the current classification schedule. A preliminary analysis suggests an average cost of approximately $12 per benefitted acre, though actual assessments will vary depending on percentage of benefit. The Auditor's Office has the current assessment schedule on file.

Installment Payment Options
Under Iowa drainage law, landowners who are assessed for substantial improvements may be eligible to pay their assessment over time. For Drainage District No. 61, the Board of Trustees may authorize an installment payment plan with interest, allowing landowners to repay the assessment annually over a period of up to 20 years.

To take advantage of this option, a formal waiver request must be submitted. There is no penalty for early repayment, and landowners who wish to avoid interest may pay the full amount up front or consider private financing alternatives.

Taxes
While the district is not authorized to provide tax advice, landowners are encouraged to consult with their accountant or tax advisor to determine whether drainage assessments or related improvements may be deductible or eligible for depreciation under current tax laws.

Permitting

US Army Corps of Engineers (USACE)
Because the downstream creek is considered a jurisdictional water under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act, the proposed work including excavation and bank stabilization falls under the regulatory authority of the U.S. Army Corps of Engineers. To avoid delays due to permitting timelines, a Section 404 and Section 10 permit application has been proactively submitted.

Iowa Department of Natural Resources (DNR)
The section of creek under study lies entirely within the 100-year floodplain, meaning there is a 1% chance of a major flood each year. The Iowa DNR Draft 1% Flood Extent Map is shown in Appendix G. All work on the creek, including channel excavation and bank stabilization, must follow Iowa DNR floodplain regulations. The DNR Floodplain permit application has been submitted in advance to avoid delays.

U.S. Fish and Wildlife Service (USFWS)
Tree clearing activities require coordination with USFWS to ensure compliance with the Migratory Bird Treaty Act and relevant species protection guidelines. Tree clearing is anticipated to occur winter of 2025-2026, and the required application has been proactively submitted to reduce the risk of project delays.

Water Quality Recommendations

Conservation Practices
While the Drainage District does not have the authority to require conservation practices, we strongly recommend that landowners consult their local NRCS office to evaluate which options best suit their operation. Conservation practices, particularly those installed at the field edge or within the field, can improve water quality, reduce input costs, control erosion, and support long-term soil health. Many of these practices are supported by research and have financial assistance available through programs such as EQIP, CSP, and the Iowa Water Quality Initiative.

Edge-of-Field Practices

- **Buffer Strips**
  Grass buffer strips along streambanks and ditches are one of the most effective ways to intercept runoff. These vegetated zones filter sediment, absorb nutrients like nitrogen and phosphorus, and reduce pesticide transport. They also stabilize streambanks, minimize erosion, and provide habitat for pollinators and wildlife.

- **Grassed Waterways**
  For fields with concentrated flow paths, grassed waterways help prevent gully formation and safely carry runoff away from cropland. Their dense vegetation reduces water velocity, limits soil loss, and improves downstream water quality. University of Illinois research (2018) showed that grassed waterways decreased gully erosion by up to 75%.

- **Constructed Wetlands**
  Constructed wetlands are engineered systems designed to intercept surface or subsurface drainage before it enters ditches or streams. By slowing water flow, they promote the natural removal of nitrates through microbial activity in the soil. In addition to improving downstream water quality, these systems provide valuable habitat for aquatic life, waterfowl, and other wildlife.

- **Saturated Buffers and Bioreactors**
  Saturated buffers and woodchip bioreactors are designed to treat water from subsurface tile outlets before it reaches open water. Saturated buffers route tile water through vegetated riparian areas where soil microbes and plants naturally reduce nitrate levels. Bioreactors use buried woodchips to create an anaerobic zone that encourages denitrification.

  Research from Iowa State University (2016–2020) found that saturated buffers reduced nitrate concentrations in drainage water by 40–80%, while bioreactors achieved 20–40% nitrate reduction. Both options are relatively low maintenance once installed and are effective tools for addressing nitrogen loss from tile-drained fields.

In-Field Practices

- **Cover Crops**
  Cover crops, such as cereal rye, clover, or radish, are planted after harvest to protect the soil during the off-season. Their root systems reduce erosion, improve soil structure, promote microbial activity, and capture residual nutrients, particularly nitrogen, before they leach into tile systems.

  A 2017–2021 University of Minnesota study found that cover crops reduced nitrate leaching by 30–60% in tile-drained fields and increased soil organic matter by 0.5–1% over five years, supporting both environmental and agronomic benefits.

- **Conservation Tillage or No-Till**
  Reducing tillage helps maintain soil structure, increase organic matter, and reduce erosion and runoff. Better soil structure improves water infiltration, and crop residue left on the surface protects the soil during rainfall events.

  An Ohio State University study examining conventional tillage, no-till, and strip-till systems found that conservation tillage performed best when paired with subsurface drainage. No-till and strip-till fields retained higher soil structure and moisture balance, reduced erosion, and improved crop trafficability. In drained fields, corn-soybean rotations under no-till produced the highest yield benefit, while continuous corn also showed consistent improvements. The study concluded that subsurface drainage not only improved yields directly, but also enhanced the effectiveness of conservation tillage systems by improving field conditions.

- **Precision Nutrient Management**
  Precision agriculture tools like soil sampling, yield mapping, and variable rate technology (VRT) allow targeted application of fertilizers and pesticides. This approach reduces the risk of nutrient runoff, improves fertilizer use efficiency, and increases profit margins by applying inputs only where they are needed.

- **Diversified Crop Rotations**
  Rotating corn and soybeans with small grains (e.g., oats or wheat) or forage crops can improve soil health, break pest and disease cycles, and reduce nitrogen imbalances. These rotations increase biological diversity in the field and may open new marketing opportunities or enhance farm resilience. A 2019 Kansas State University study reported that diversified rotations reduced nitrogen leaching by 20–30% and improved soil health metrics by 15–25%.

- **Split Nitrogen Applications and Stabilizers**
  Applying nitrogen in multiple smaller doses throughout the growing season, instead of a single application, reduces the chance of leaching. Using nitrogen stabilizers or inhibitors further minimizes loss by keeping nutrients in forms more available for plant uptake.

Cost-share funding is often available to help implement these practices. The Iowa Agriculture Water Alliance hosts an online tool- https://costsharecompare.com/ where landowners can search for financial assistance by ZIP code, compare multiple programs, and identify opportunities to stack funding sources for greater return on investment.

Although the Drainage District cannot mandate conservation improvements, these practices are strongly recommended. They are supported by decades of research and can significantly reduce nutrient runoff, protect soil, and improve long-term farm viability. Every operation is different, and NRCS staff can help design customized solutions that align environmental goals with productivity and profitability.

Maintenance and Long-Term Management

Warranty Period
It is not uncommon for tile outlets to be missed or for other issues to arise during or shortly after construction. To address this, the drainage district will maintain a one-year warranty with the contractor to cover construction-related errors or unforeseen problems. If a landowner observes an issue during this period, they should contact the Drainage Clerk so the district can investigate and coordinate any necessary repairs.

Work Orders
Drainage district systems are typically low-maintenance due to their passive, gravity-driven design. However, open ditches generally require more frequent upkeep than subsurface tile lines. Large-scale ditch cleanouts are usually needed every 30 to 50 years, with smaller maintenance activities occurring more regularly.

After the one-year warranty period expires, any repairs must be initiated through a formal work order. A landowner may submit a work order to the Drainage Clerk to request repairs to the district system. Common issues include tile blowouts, collapsed outlets, bank erosion, or obstructions such as beaver dams.

Once a work order is reviewed and approved, a contractor will be assigned to complete the repair. The drainage district will pay the contractor's invoice, and the cost will be shared among all landowners based on the existing assessment schedule. This process ensures that maintenance is handled in a timely, fair, and consistent manner.

Landowner Considerations

Public Hearing on Report
A public hearing will be scheduled to review this engineer's report and the proposed improvements. Per Iowa Code § 468.14, all landowners in the district will be notified by mail, and notice will also be published in a local newspaper. At the hearing, we will present our findings, proposed plans, and cost estimates, and will be available to answer questions and address concerns. Topics such as construction impacts and crop damages may also be discussed.

The Board of Trustees will conduct the hearing and may continue it to a later date if more discussion or information is needed. No decision can be made until the hearing is held and all landowner input is considered. This report may be amended as needed in response to feedback received during the hearing, ensuring transparency and meaningful participation.

Objections and Remonstrance
Landowners with concerns about the proposed improvements are encouraged to submit written objections before or during the hearing. Written submissions become part of the official record and help guide any revisions to the report.

Additionally, landowners may formally oppose the project through a remonstrance under Iowa Code § 468.28. A valid remonstrance requires written objections from at least 50% of landowners who collectively own more than 70% of the land subject to assessment, submitted before the hearing concludes. If a valid remonstrance is filed, the Board cannot proceed with the project. Landowners pursuing this option should include their land holdings and clearly state their opposition in writing.

Utility Conflicts and Coordination
A Design One Call was completed on September 10th, 2025. The utilities identified within the project area included buried communication lines located within the public road rights-of-way on 475th Street and 485th Street.

Prior to construction, the contractor will be required to complete a Construction One Call to ensure that utility locations are properly marked and documented in accordance with Iowa One Call law.

Right-of-Way and Work Limits
As part of the proposed outlet improvements for Drainage District No. 61, the district will need to acquire permanent right-of-way (ROW) easements along the downstream creek. Currently, there is no formal ROW in this area.

The proposed ROW covers about 17.53 acres across 13 parcels, as shown in Appendix H and on the enclosed plans. The plans also show the temporary work limits needed for construction access. Construction-related damages are addressed in a separate section of the report.

Under Iowa Code §§ 468.12 and 468.24–468.27, drainage districts can acquire permanent easements for maintenance and repairs. If the Board moves forward, a compensation commission made up of two landowners and an engineer will recommend fair payment. The report will be reviewed at a public hearing before any final decisions are made.

Landowner Construction Considerations
If the project is approved, construction will proceed through the standard public bidding process. A bid letting will be conducted to solicit competitive proposals, with the lowest responsible bid submitted to the Board of Trustees for approval. Prior to the start of construction, all affected landowners will be notified of the anticipated timeline and project scope. Work areas will be staked in the field and marked on the plans, and landowner cooperation, including preserving survey stakes and allowing access, will be essential to support efficient project execution.

Throughout construction, we will coordinate directly with the contractor and act as the primary point of contact for all landowners. To ensure clear and consistent communication, landowners will be asked to direct any questions or concerns to us rather than contacting the contractor directly.

Construction Timeline
To facilitate early progress while permitting is finalized, we recommend construction to occur in two phases:

- **Phase 1**: Tree clearing and grubbing, to occur during winter.
- **Phase 2**: Channel cleanout, bank reshaping, and seeding, to begin once all permits are received.

This sequencing improves access and visibility for survey and material estimates. A completion deadline will be specified in the bid documents. The contractor is responsible for managing their schedule, but must complete the project within the set timeframe and per the approved specifications.

Construction Damages
In accordance with Iowa Code § 468.103, landowners are entitled to compensation for damages resulting from construction activities, including crop loss, soil disturbance, and impacts to land use.

The following recommendations are provided regarding crop damage compensation:

- **Yield and Price Calculation**
  For crops damaged during the growing season we recommend using 110% of the five-year average county yield for the affected crop, multiplied by the average price received over the past 12 months. Both the yield data and average price are to be sourced from the Iowa State University Extension and Outreach and USDA-NASS databases.

- **Field Repair Work Compensation**
  In addition to crop losses during the growing season, we recommend payment for the following field work at rates consistent with the most recent Iowa State University Custom Rate Survey (per acre):
    - One pass of rock pickup
    - Two passes of tillage: one deep tillage and one shallow tillage

- **Other Damages**
  Landowners may submit claims for any additional damages not accounted for in this recommendation prior to the completion hearing.

Crop damages and other construction-related compensation will be paid by the drainage district and funded through the assessment schedule. As a result, all landowners within the district including those who incur damages will share in the cost of these payments through their proportionate assessments. The Board of Trustees retains the authority to amend, approve, or deny any such claims. Final decisions regarding crop damages will be made at the completion hearing.

Estimated Damaged Area

The current plans show an estimated 31.5 acres will be impacted by construction, including areas required for construction, construction paths, and driveway access. The majority of the impacted area is non-cropland. While work limits are shown in the engineering plans, they may shift slightly depending on final alignments. The actual area affected will be surveyed and documented during or after construction.

Completion Hearing

Upon completion of construction, a Completion Hearing will be held in accordance with Iowa Code § 468.101. This hearing gives landowners the opportunity to review the finished work, raise concerns about field conditions or project compliance, and submit any remaining claims for damages not previously addressed.

At the hearing, the Board of Trustees will consider all landowner input, evaluate whether the work has been completed in substantial compliance with the approved plans and specifications, and determine final compensation for any valid damage claims. The Board also has the authority to amend, approve, or deny claims based on the evidence presented.

All landowners within the district will be notified of the hearing in advance, as required by law, and are encouraged to attend to ensure their concerns are heard and properly documented before the project is closed out.

Conclusion and Recommendations

Conclusion

The downstream outlet has been found to be restrictive and significantly undersized compared to the improved ditch upstream. While the proposed work will not achieve the full capacity of a modern agricultural drainage ditch, it will provide meaningful improvement while minimizing impacts relative to a full-scale reconstruction. The estimated cost to implement this plan is $405,000.

Recommendations

We recommend that the Board accept the filing of this report and schedule a public hearing to formally present the findings and proposed improvements to all affected landowners. The hearing will provide an opportunity for landowners to raise objections, ask questions, and express concerns.

If there is sufficient support from the landowners at the hearing, we further recommend that the Board proceed with the following steps:

- Appoint an engineer to prepare detailed plans and specifications for the construction work.
- Request a Right-of-Way Report to document necessary easements and access for the project.

If the Board of Trustees or landowners have any questions or concerns, please feel free to contact AgriVia at the phone numbers or emails listed.

Sincerely,

Jacob Hagan, P.E.
AgriVia
Cell: 712-250-43118
Email: jacob.agrivia@gmail.com

Tyler Buman, E.I.T.
AgriVia
Cell: 712-579-5296
Email: tyler.agrivia@gmail.com

Appendix A – Petition Filed

FILE

AUG 20 2024

PALO ALTO COUNTY
AUDITOR'S OFFICE

DRAINAGE PETITION

TO: THE BOARD OF TRUSTEES OF PALO ALTO COUNTY, IOWA, ACTING ON BEHALF OF DD 61 Main open DISTRICT IN PALO ALTO COUNTY, IOWA

COMES NOW, the undersigned Petitioners, being owners of the real estate in this drainage district and in making this petition for drainage relief for the drainage of said lands respectfully state to the Board of Trustees of Palo Alto County, Iowa:

1. That the lands of these petitioners are a part of and are included in DD 61 Main open District, Palo Alto County, Iowa, and that said lands are assessed for drainage tax by virtue of the improvements in said district.

2. That the drainage facilities in their present condition in this district are not sufficient to properly drain the water from the lands of these petitioners as well as other lands; that such lands are subject to overflow, too wet for cultivation, and are subject to erosion and flood danger; that if the improvements in said drainage district were properly repaired or otherwise properly constructed to correct the current situation, the public benefit, utility, health and welfare would be promoted.

3. That these petitioners do not have exact knowledge or information as to the exact nature of the work to be done to correct the situation, but that these petitioners are of the belief that an investigation of the situation by a qualified independent engineer would determine the exact nature of the work required to provide adequate drainage for the lands of these petitioners and adjoining lands.

4. That these petitioners respectfully request that the Board of Trustees of Palo Alto County, Iowa, acting on behalf of DD 61 Main Open District, in Palo Alto County, appoint an independent qualified engineer to make the necessary investigation, report and survey in this situation.

5. That these petitioners, being the owners of lands which are a part of this drainage district, are entitled to adequate drainage from improvements in this drainage district for such lands.

6. That these petitioners are signing this petition pursuant to Section 468.126 of the Code of Iowa.

WHEREFORE, these petitioners respectfully request that the Board of Trustees of Palo Alto County, Iowa, acting on behalf of DD 61 Main Open District appoint an independent qualified engineer to investigate the drainage situation herein referred to with respect to petitioners' land and other lands; and that the board of trustees order that district facilities be improved, reconstructed, or repaired to provide adequate drainage relief for the lands of these petitioners and adjoining lands as above described.

Dated this 20th day of August, 2024.

LANDOWNERS	DESCRIPTION OF LAND
Martin + Doris Zaugg Family LLC By Martin Zaugg Mgr Member	West Bend Sec 13 Clean out Bridge & road ditch ADD 2 72" CALVERTS CLEAN OUT 3,000 FT SOUTH BRIDGE

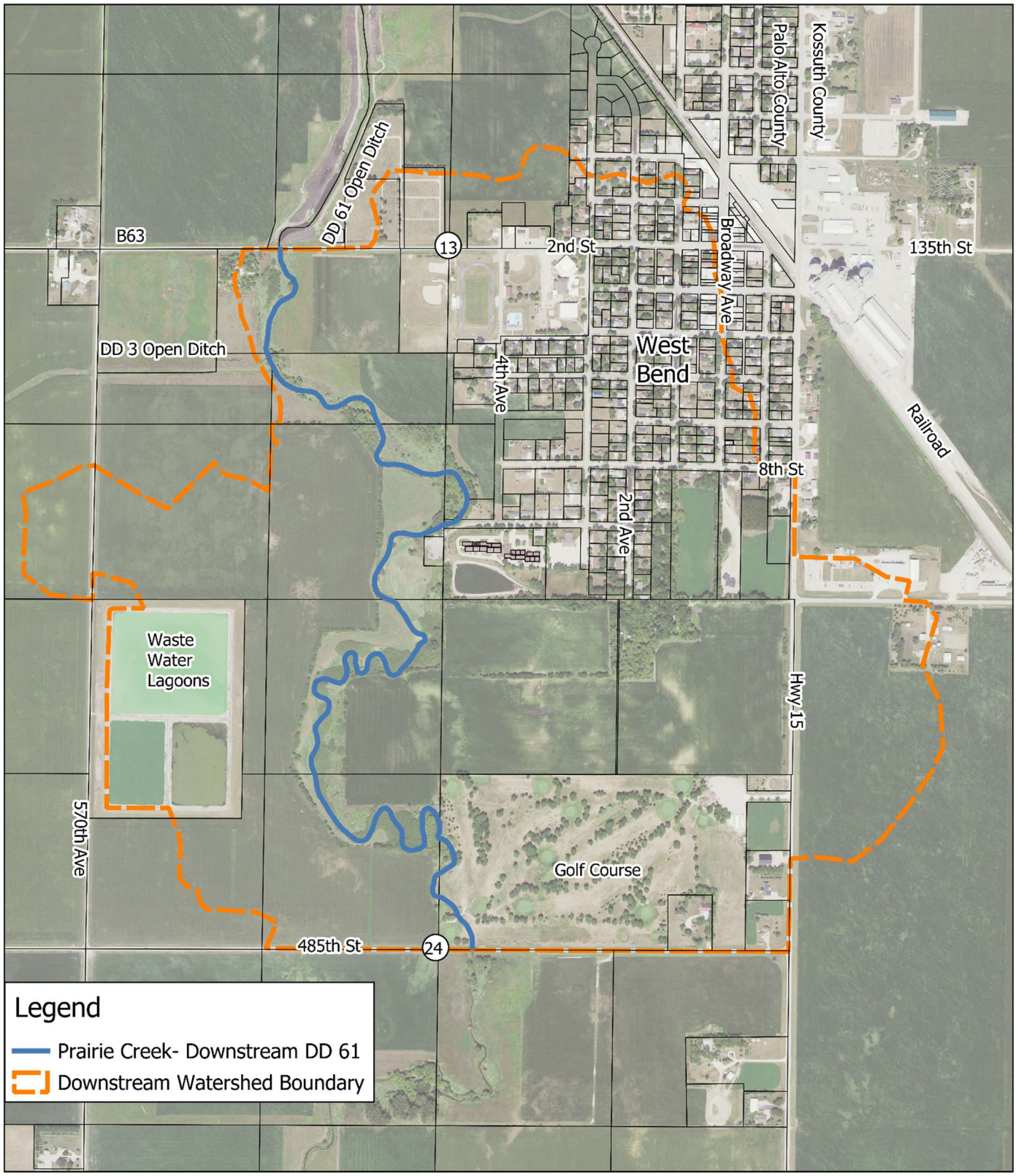
AgriVia

Downstream of Drainage District No. 61

Palo Alto County, IA

Area of Study

September 2025



Appendix C – Drone and Survey Photos


Date & Time: Mon, Sep 01, 2025 at 15:59:20 CDT
Position: +042.945231° / -094.452985° (±8.4ft)
Altitude: 1148ft (±9.8ft)
Datum: WGS-84
Azimuth/Bearing: 323° N37W 5742mils True (±11°)
Elevation Angle: -07.2°
Horizon Angle: -00.2°
Zoom: 1.0X
croplqnd erosion

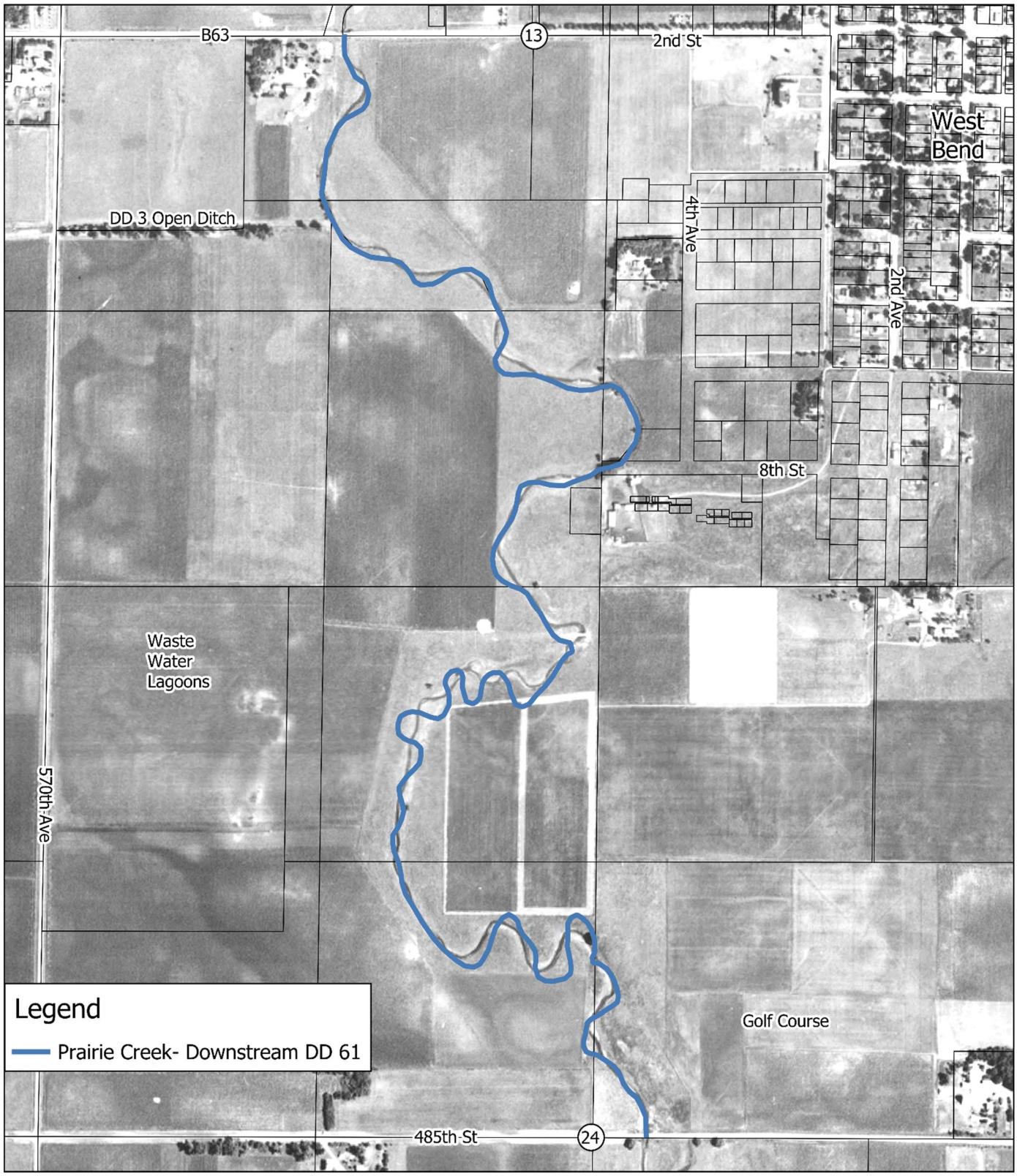

Date & Time: Mon, Sep 01, 2025 at 15:22:15 CDT
Position: +042.958587° / -094.457598° (±8.7ft)
Altitude: 1153ft (±9.8ft)
Datum: WGS-84
Azimuth/Bearing: 147° S33E 2613mils True (±14°)
Elevation Angle: -20.3°
Horizon Angle: -00.4°
Zoom: 0.5X

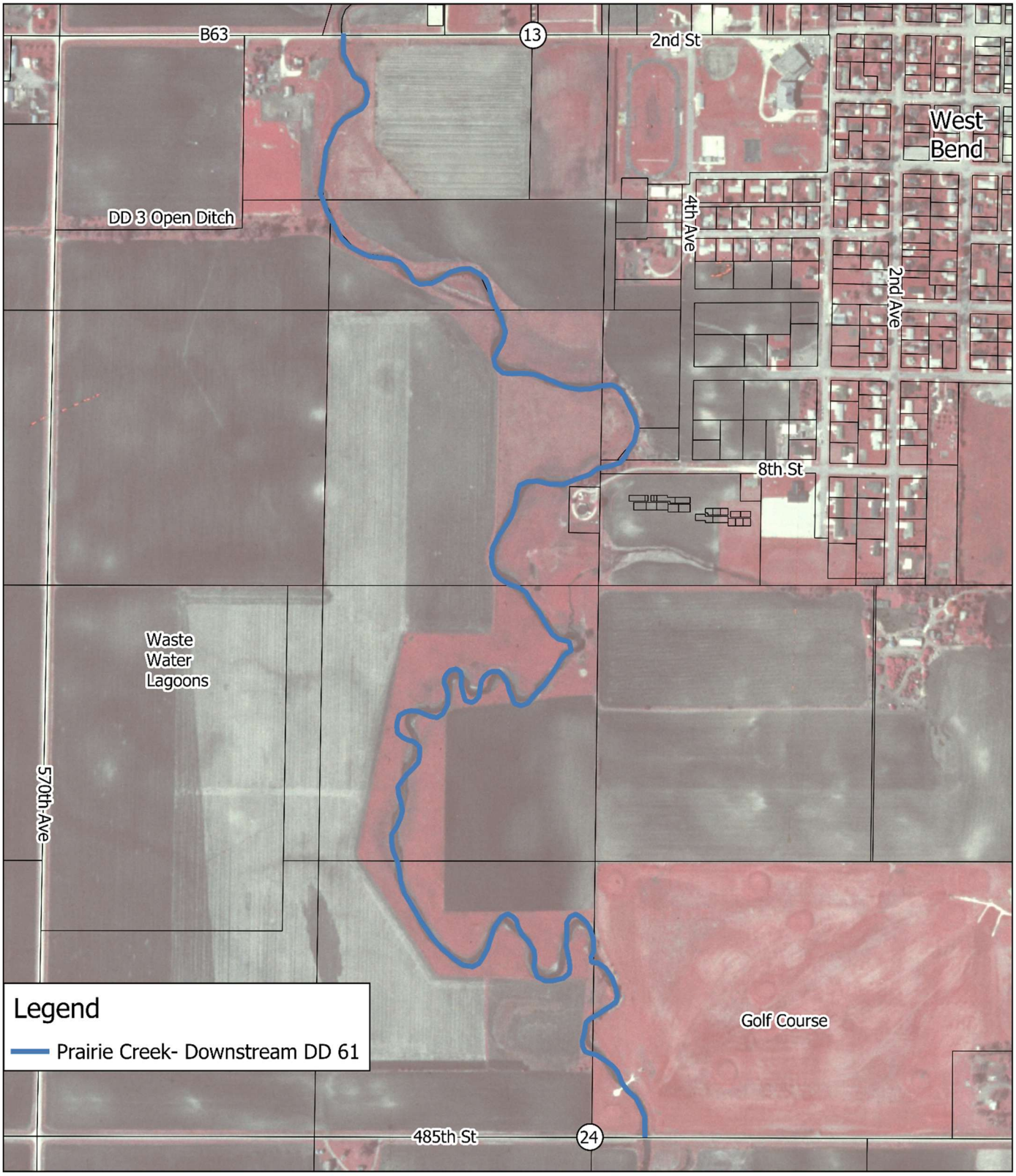

Date & Time: Mon, Sep 01, 2025 at 15:57:59 CDT
Position: +042.944627° / -094.452168° (±7.0ft)
Altitude: 1142ft (±9.8ft)
Datum: WGS-84
Azimuth/Bearing: 055° N55E 0978mils True (±11°)
Elevation Angle: -22.5°
Horizon Angle: +00.7°
Zoom: 0.5X

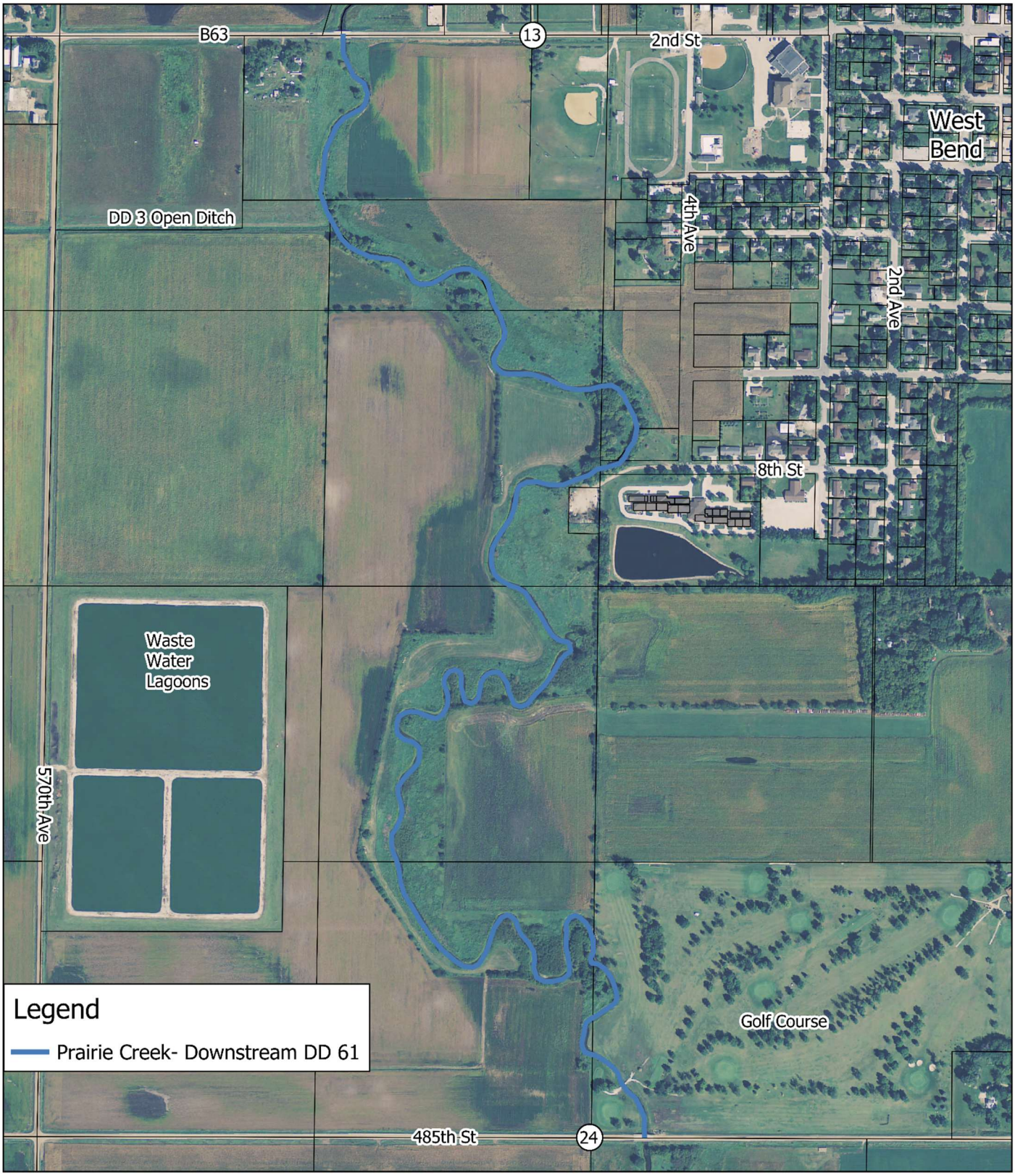

Date & Time: Mon, Sep 01, 2025 at 15:26:17 CDT
Position: +042.958436° / -094.457671° (±9.1ft)
Altitude: 1150ft (±9.8ft)
Datum: WGS-84
Azimuth/Bearing: 038° N38E 0676mils True (±11°)
Elevation Angle: -15.1°
Horizon Angle: -00.5°
Zoom: 0.5X

Downstream of Drainage District No. 61
Palo Alto County, IA

1930s Aerial Photo
September 2025




B63
13
2nd St
West Bend
DD 3 Open Ditch
4th Ave
2nd Ave
8th St
Waste Water Lagoons
570th Ave
Golf Course
485th St
24
Legend
Prairie Creek- Downstream DD 61


B63
13
2nd St
West Bend
DD 3 Open Ditch
4th Ave
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Waste Water Lagoons
570th Ave
Golf Course
485th St
24
Legend
Prairie Creek- Downstream DD 61

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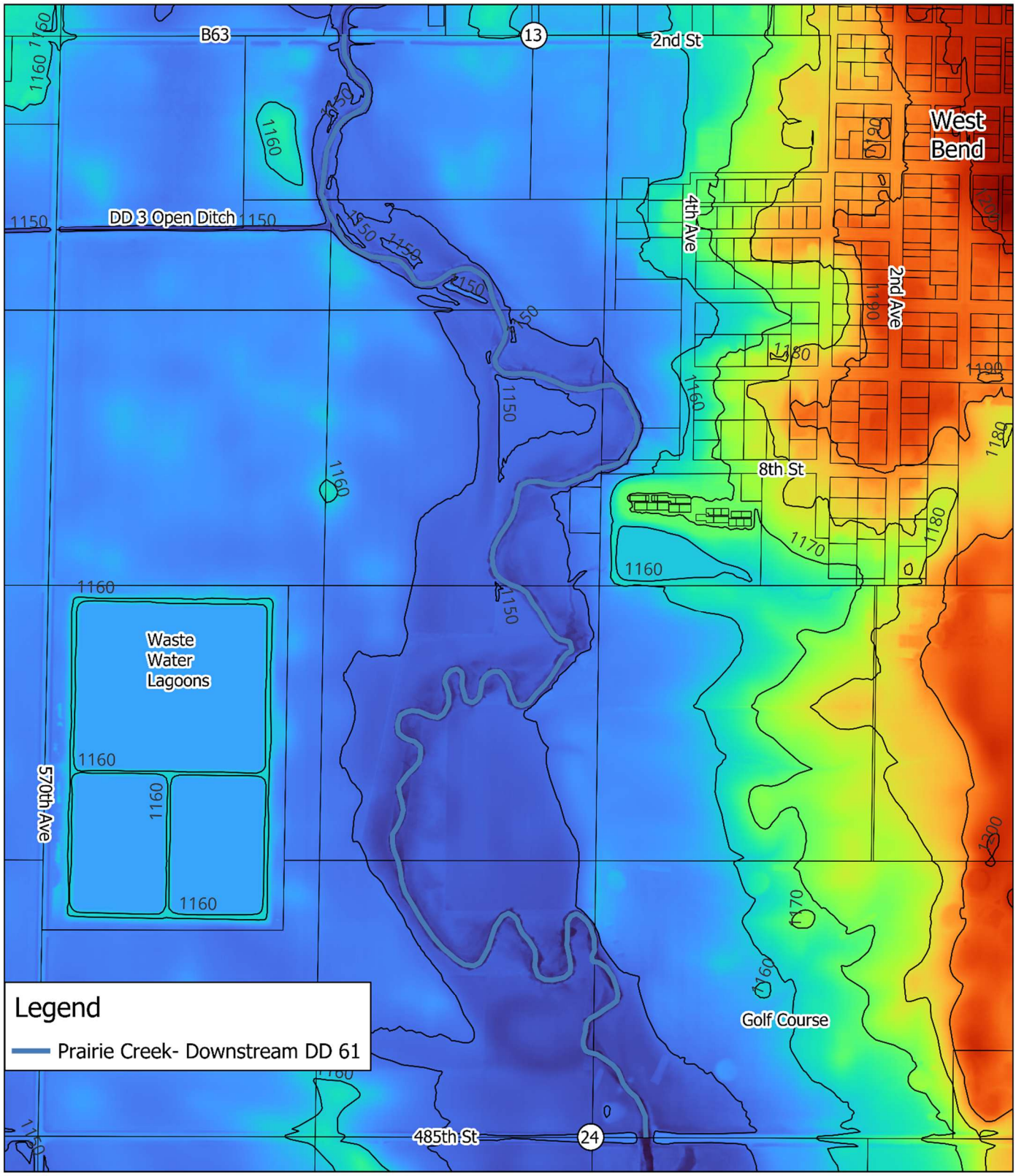
Downstream of Drainage District No. 61

Palo Alto County, IA

Elevation

September 2025



Appendix F – Detailed Cost Estimate

Estimated Costs
Downstream Outlet Improvements
Drainage District No. 61
Palo Alto County, IA

Winter Tree Clearing Construction Cost						
Item No.	Item Code	Bid Item	Est. Units	Unit	Est. Unit Price	Est. Amount
101	2010-A	Clearing and Grubbing , Acres	9.5	ACRE	$5,000	$ 47,500
102	2010-A	Clearing and Grubbing , Units	445	UNIT	$30	$ 13,350
103	NRCS-IA-06	Seeding, Cover Crop	9.5	ACRE	$100	$ 950
104	NRCS-IA-05	Pollution Control	1	LS	$1,000	$ 1,000
105	11,020-A	Mobilization	1	LS	$3,300	$ 3,300
					Subtotal Construction Cost	**$ 66,100**

Spring Downstream Cleanout Construction Cost						
Item No.	Item Code	Bid Item	Est. Units	Unit	Est. Unit Price	Est. Amount
201	2010-E	Excavation	94	STA	$1,100	$ 103,400
202	NRCS-IA-06	Seeding, Ditch Banks	94	STA	$100	$ 9,400
203	2010-E	Spoil Leveling, Both Sides	94	STA	$150	$ 14,100
204	2010-E	Spoil Tillage and Rock Pick-Up	94	STA	$50	$ 4,700
205	NRCS-IA-06	Seeding, Cover Crop	17.5	ACRE	$150	$ 2,625
206	NRCS-IA-51	Tile Outlet, 12" CMP	200	LF	$35	$ 7,000
207	9040-J	RipRap, Class E	250	TN	$60	$ 15,000
207	NRCS-IA-05	Pollution Control	1	LS	$1,000	$ 1,000
208	11,020-A	Mobilization	1	LS	$8,300	$ 8,300
					Subtotal Construction Cost	**$ 165,525**

Additional Non-Construction Project Costs	
Expense Category	Est. Amount
Survey, Engineer's Report, Plans, & Permitting	$ 15,000
Specifications, Bidding, and Construction Engineering	$ 40,000
Legal and Administrative	$ 5,000
Construction Damages	$ 10,000
Right-of-Way Costs	$ 50,000
Interest	$ 30,000
Subtotal Non-Construction Cost	**$ 150,000**

Total Project Costs	
Expense	Est. Amount
Winter Tree Clearing Construction Cost	$ 66,100
Spring Downstream Cleanout Construction Cost	$ 165,525
10% Construction Contingency	$ 23,000
Additional Non-Construction Project Costs	$ 150,000
Total Cost to Drainage District No. 61	**$404,625**

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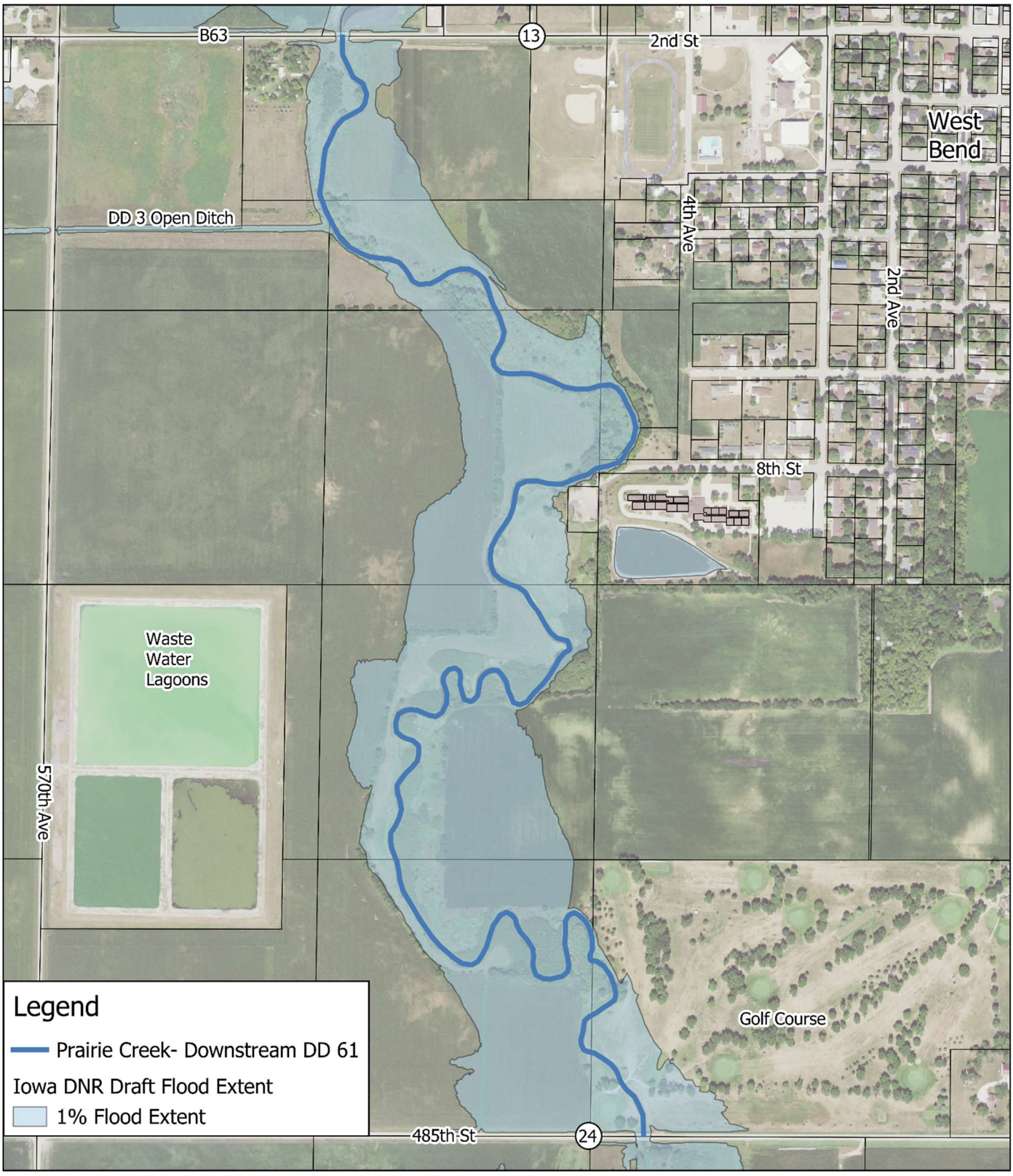
Downstream of Drainage District No. 61

Palo Alto County, IA

1% Flood Map

September 2025



Appendix H- Right-of-Way Recommendation

Right-of-Way Recommendation
Downstream Outlet Improvements
Drainage District No. 61
Palo Alto County, IA

Recommended Right-of-Way					
PIN	**Deedholder**	**STR**	**Legal**	**Proposed Width (ft)**	**Acres**
690012004001	APOSTOLIC CHRISTIAN RETIREMENT VILLAGE	13-94-31	MIKES SUNSET ADDN LOTS 2 THRU 5 BLK 4 VAC 4TH AVE W, TR IN OUTLOT 1 & ADJ TR SW SE 13-94-31 COMMONS AREA	75	0.01
510013003040	BRECHLER, DONNA R	13-94-31	SE SW	75	3.09
510024002010	BRECHLER, DONNA R	24-94-31	NE NW	75	4.69
510024002040	BRECHLER, DONNA R	24-94-31	SE NW	75	3.84
510013003013	GERBER, CARL D & SARA A, JT TEN	13-94-31	PT. NE SW	37.5	0.92
510013003012	MONTAG FAMILY FARM, LLC	13-94-31	PT. NE SW	37.5	0.95
510013003022	MONTAG FAMILY FARM, LLC	13-94-31	PT. NW SW	37.5	0.14
700019007001	MONTAG FAMILY FARM, LLC	13-94-31	AGRIC LAND W1/2 SW1/4 SE1/4	75	0.63
510013003020	MONTAG, JAMES E & SARAH P, JTS	13-94-31	PT. NW SW	37.5	0.71
700019007010	SCHNEIDER,GARY&SUSAN,REVT R1/3,BANWART,KENNETH &	13-94-31	AGRIC LAND W1/2 SW1/4 SE1/4	37.5	0.18
510024001030	WEST BEND GOLF & COUNTRY CLUB	24-94-31	SW NE & 26.41 ACRE TRACT SE NE	75	1.57
510013003041	WEST BEND, TOWN OF	13-94-31	.88 ACRE TRACT SE SW	37.5	0.01
510013003011	ZAUGG, DAVID M & MELISSA	13-94-31	PT. NE SW	37.5	0.79
				Total Acres	**17.53**

PRELIMINARY PLANS FOR
DRAINAGE DISTRICT NO. 61
DOWNSTREAM OUTLET IMPROVEMENTS
PALO ALTO COUNTY, IA
2025

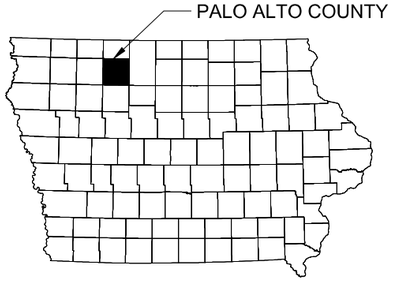
IOWA ONE CALL SM
1-800-292-8989
www.iowaonecall.com
811 Know what's Below. Call before you dig.

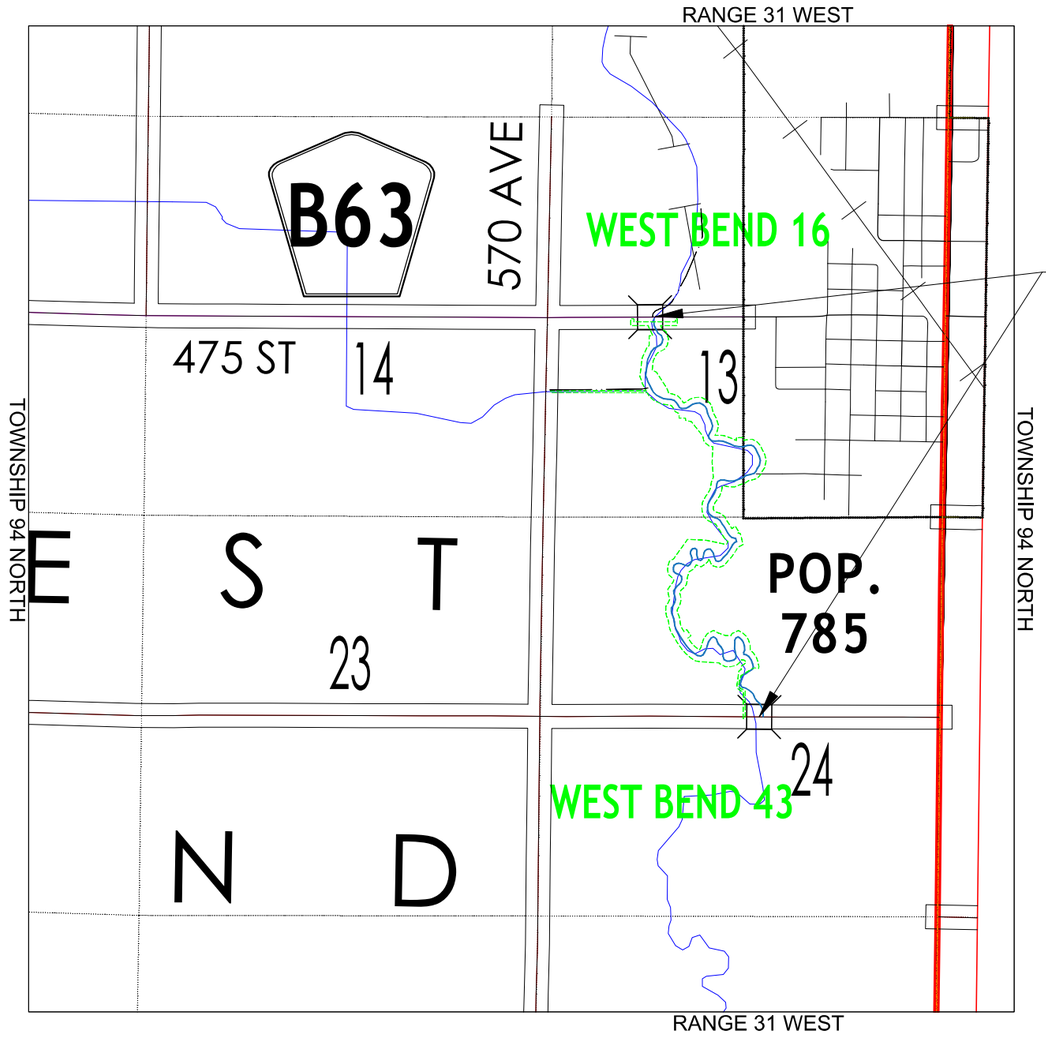
The contractor shall field verify exact locations prior to commencing construction as required by state law. Notify Iowa One Call, 811 or 1-800-292-8989.

SPECIFICATIONS

Unless otherwise noted, the governing standards for this project shall be the 2025 edition of the Iowa Statewide Urban Design and Specifications (SUDAS) for Public Improvements, supplemented where referenced by the Iowa Department of Transportation's Standard Specifications for Highway and Bridge Construction, Series 2023, along with all active general supplemental specifications, materials instructional memoranda, and relevant special provisions.

Where conflicts arise, the stricter requirement shall take precedence. Complete compliance with all applicable federal, state, and local laws, ordinances, and regulations is mandatory throughout the project's execution.





PROJECT LOCATION

Sheet Number	Sheet Title
A.01	Title Sheet
A.02	Landowner Plat
B.01	Proposed Channel Cross-Section
D.01	Tree Removal (STA -94+00 -> -80+00)
D.02	Tree Removal (STA -80+00 -> -50+00)
D.03	Tree Removal (STA -50+00 -> -20+00)
D.04	Tree Removal (STA -20+00 -> 0+00)

PROFESSIONAL ENGINEER
JACOB L. HAGAN
25738
IOWA

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Jacob L. Hagan, P.E. (date)
License No. 25738
My license renewal date is December 31, 2026.
Pages or sheets covered by this seal:
All

AgriVia

Company Information
AgriVia PLLC
PO Box 44
1124 Willis Ave
Perry, IA 50220

Designer TJB
Drafter TJB
Checker JLH

Notes
Project Datum:
State Plane, IA83-NF
NAD 88

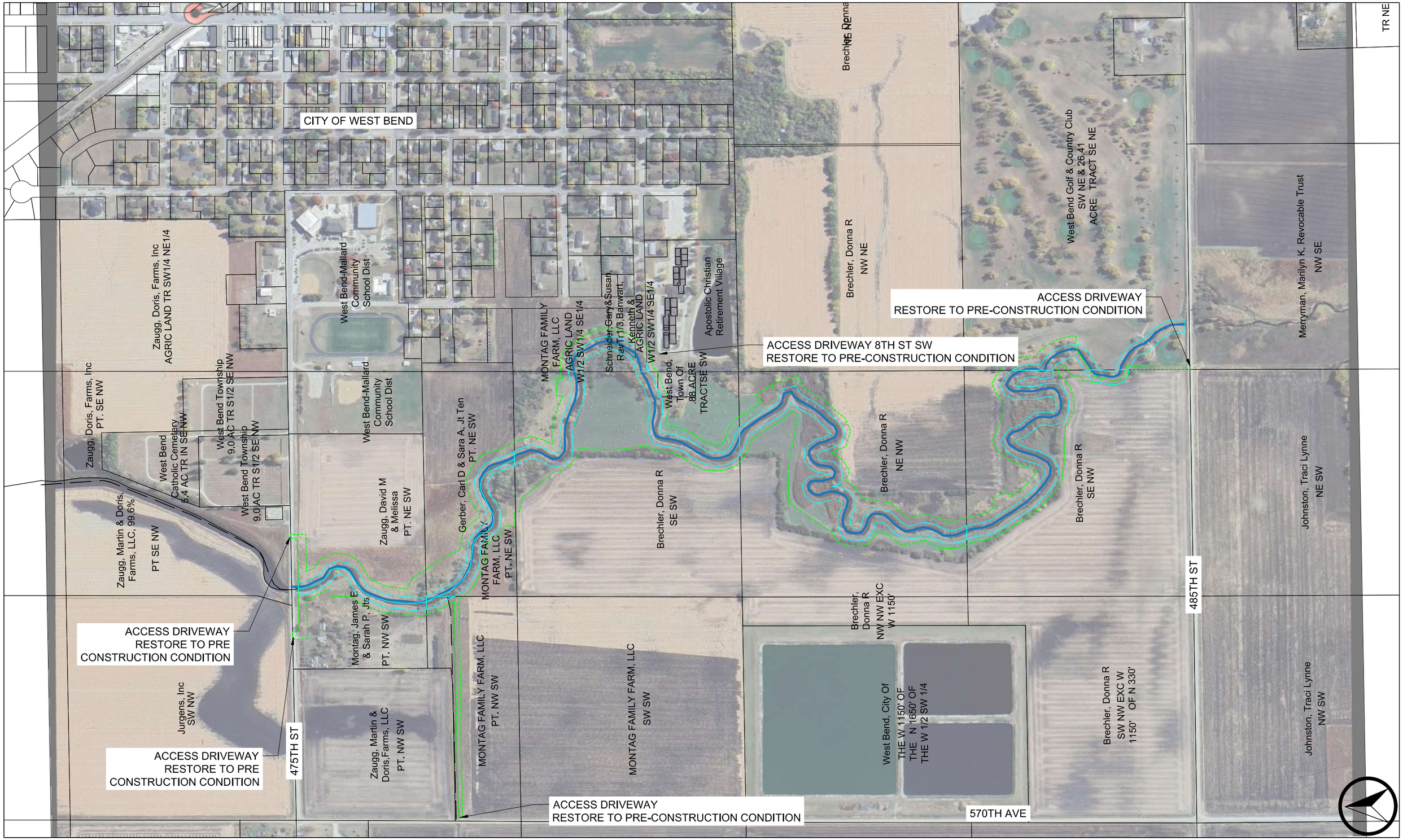
No.	Revision/Issue	Date

Sheet Name
Title Sheet

Project Name, Client, and Address
Downstream Outlet Improvements
Drainage District No. 61
Palo Alto County, IA
485th St, West Bend, IA 50597

Project 2517-74
Date 2025-09-15
Plan Scale

Sheet A.01



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1124 Willis Ave
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Designer TJB
Drafter TJB
Checker JLH

Notes

PLAN LEGEND
- Prairie Creek
- Proposed Right-of-Way
- Parcel Lines
- Work Limits
- Drainage District Facilities

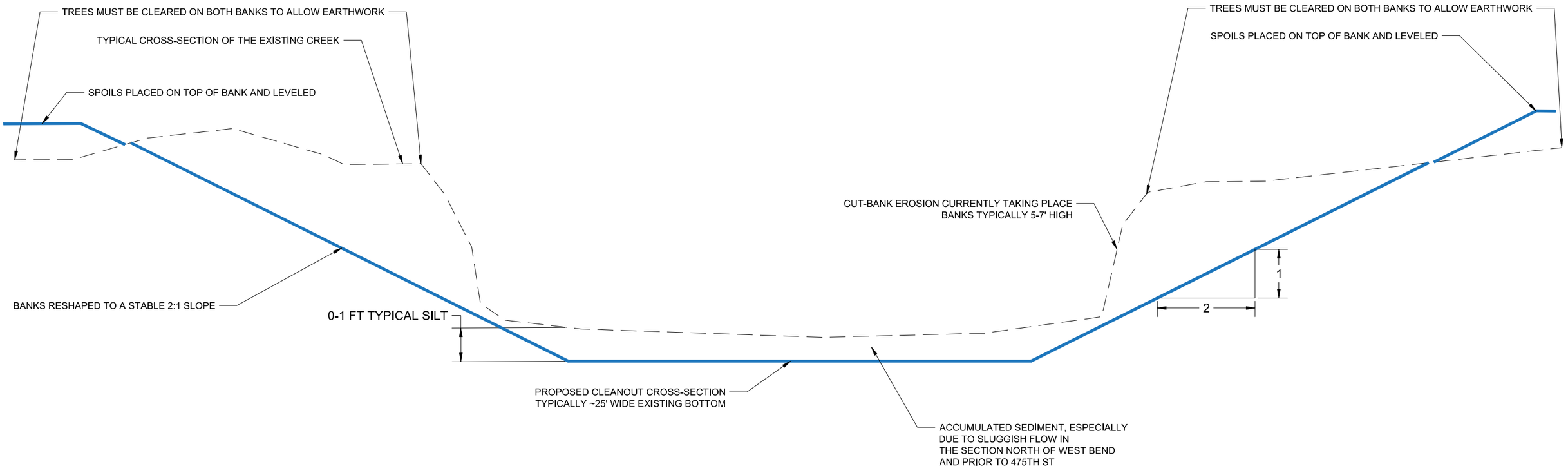
No.	Revision/Issue	Date

Sheet Name: Title Sheet

Project Name, Client, and Address
Downstream Outlet Improvements
Drainage District No. 61
Palo Alto County, IA
485th St, West Bend, IA 50597

Project: 2517-74
Date: 2025-09-15
Plan Scale: 1" = 500'
Sheet: A.02

TYPICAL PRAIRIE CREEK CROSS-SECTION



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AgriVia PLLC
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1124 Willis Ave
Perry, IA 50220

Designer TJB
Drafter TJB
Checker JLH

Notes

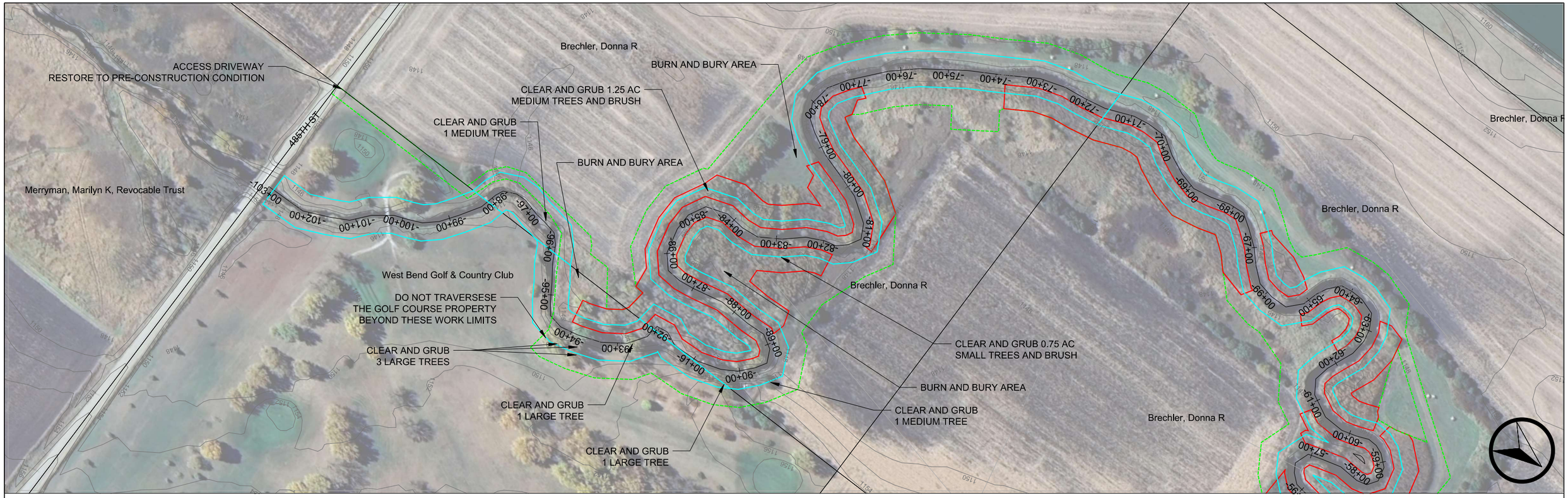
No.	Revision/Issue	Date

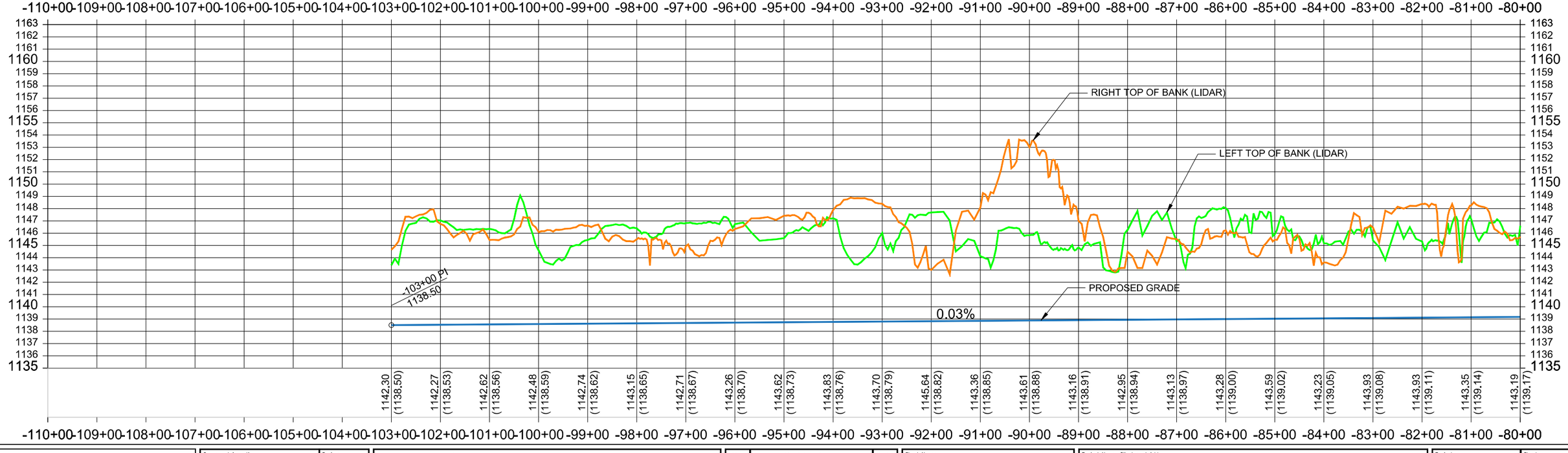
Sheet Name
Proposed Channel
Cross-Section

Project Name, Client, and Address
Downstream Outlet Improvements
Drainage District No. 61
Palo Alto County, IA
485th St, West Bend, IA 50597

Project 2517-74
Date 2025-09-15
Plan Scale

Sheet B.01





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1124 Willis Ave
Perry, IA 50220

Designer TJB
Drafter TJB
Checker JLH

Notes

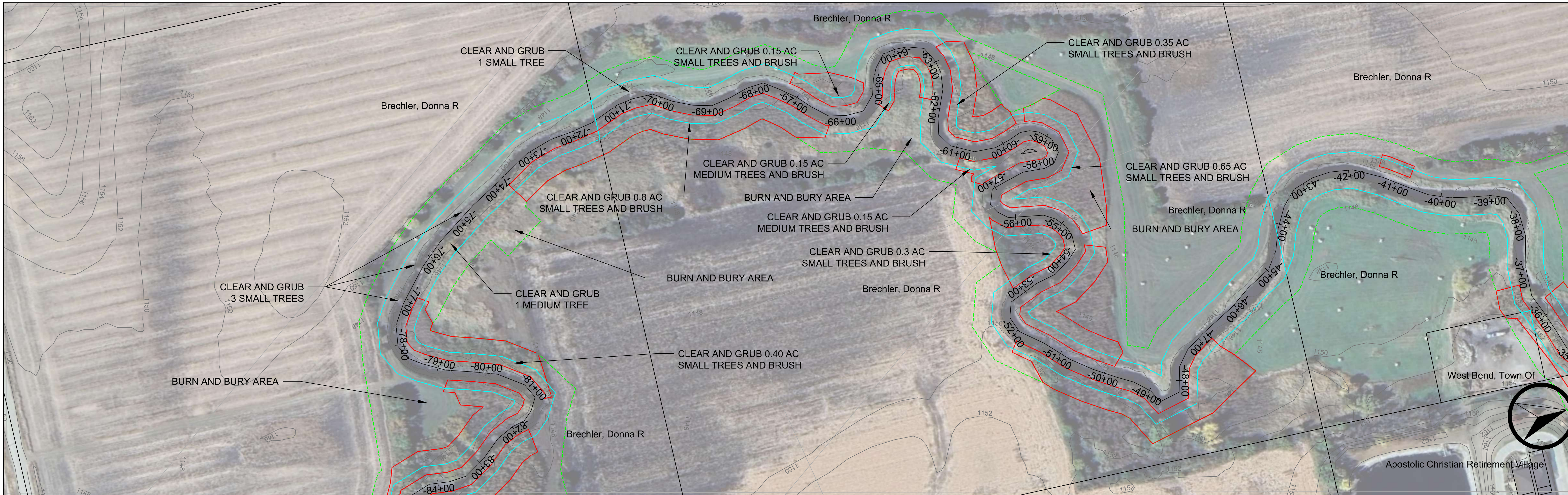
PLAN LEGEND
- Proposed Tree Clearing Zones
- Proposed Right-of-Way
- Work Limits
- 2' Contours

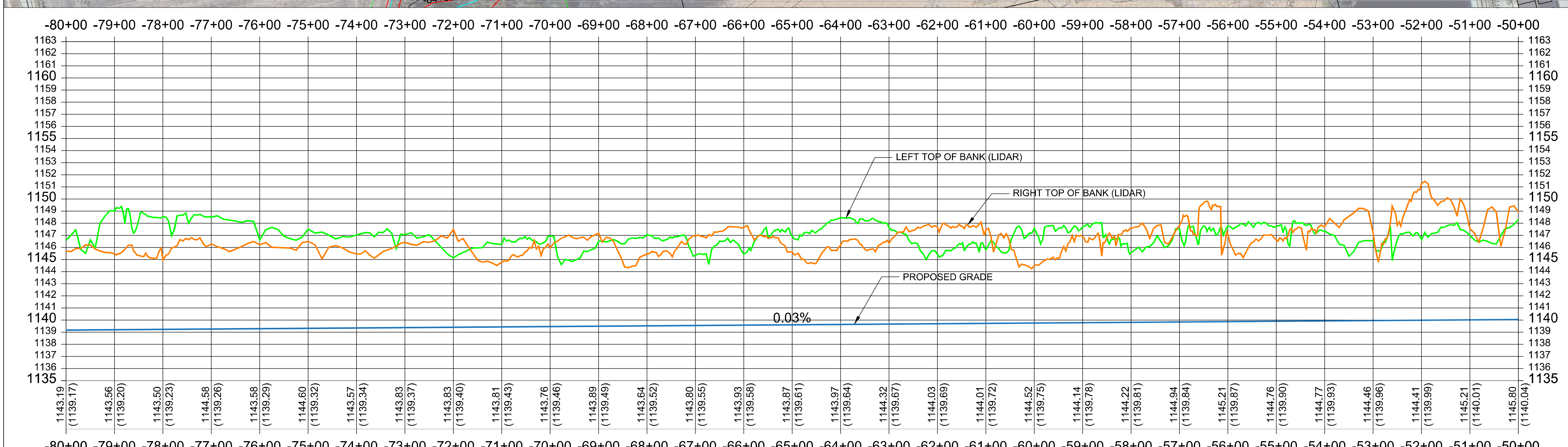
No.	Revision/Issue	Date

Sheet Name
Tree Removal
Sta -94+00 -> -80+00

Project Name, Client, and Address
Downstream Outlet Improvements
Drainage District No. 61
Palo Alto County, IA
485th St, West Bend, IA 50597

Project 2517-74
Date 2025-09-15
Plan Scale 1" = 200'
Sheet D.01





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PO Box 44
1124 Willis Ave
Perry, IA 50220

Designer: TJB
Drafter: TJB
Checker: JLH

Notes

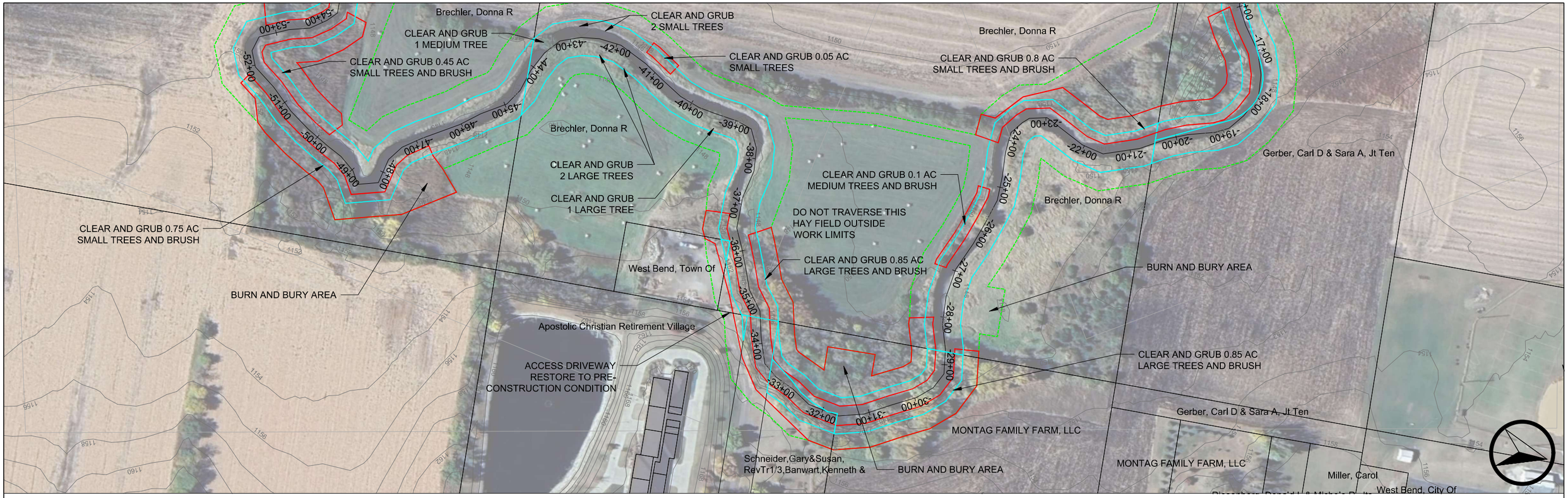
PLAN LEGEND
- Proposed Tree Clearing Zones
- Proposed Right-of-Way
- Work Limits
- 2' Contours

No.	Revision/Issue	Date

Sheet Name
Tree Removal
Sta -80+00 -> -50+00

Project Name, Client, and Address
Downstream Outlet Improvements
Drainage District No. 61
Palo Alto County, IA
485th St, West Bend, IA 50597

Project: 2517-74
Date: 2025-09-15
Plan Scale: 1" = 200'
Sheet: D.02



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1124 Willis Ave
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Designer TJB
Drafter TJB
Checker JLH

Notes

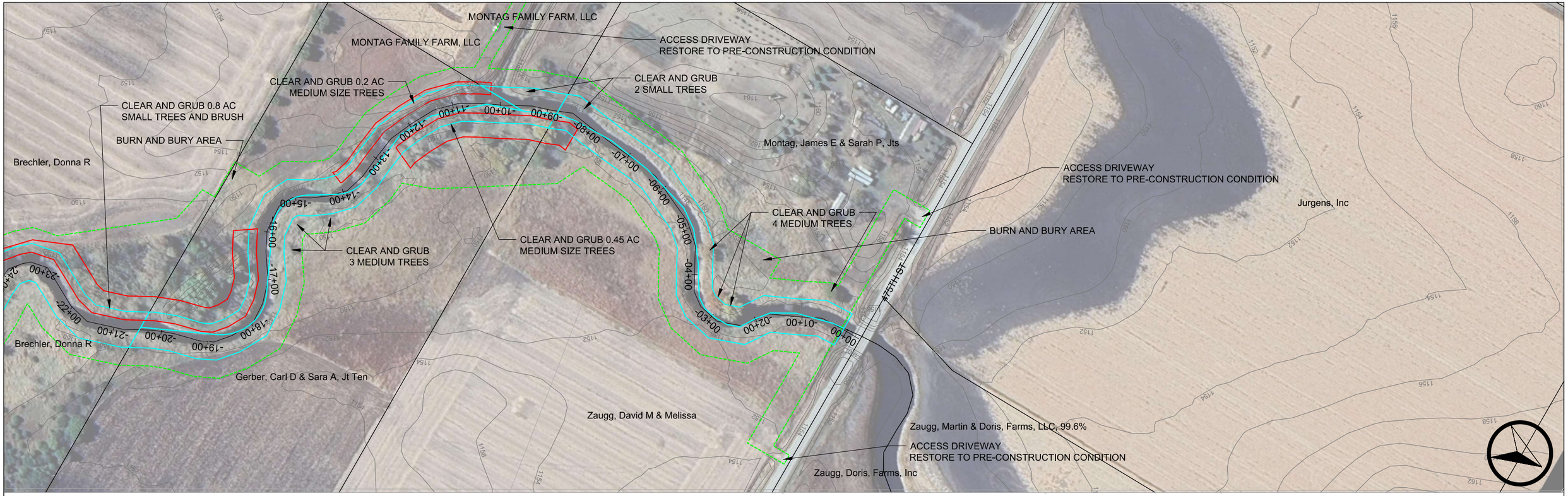
PLAN LEGEND
- Proposed Tree Clearing Zones
- Proposed Right-of-Way
- Work Limits
- 2' Contours

No.	Revision/Issue	Date

Sheet Name: Tree Removal
Sta -50+00 -> -20+00

Project Name, Client, and Address
Downstream Outlet Improvements
Drainage District No. 61
Palo Alto County, IA
485th St, West Bend, IA 50597

Project: 2517-74
Date: 2025-09-15
Plan Scale: 1" = 200'
Sheet: D.03



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Drafter TJB
Checker JLH

Notes

PLAN LEGEND
- Proposed Tree Clearing Zones
- Proposed Right-of-Way
- Work Limits
- 2' Contours

No.	Revision/Issue	Date

Sheet Name
Tree Removal
Sta -20+00 -> 0+00

Project Name, Client, and Address
Downstream Outlet Improvements
Drainage District No. 61
Palo Alto County, IA
485th St, West Bend, IA 50597

Project 2517-74
Date 2025-09-15
Plan Scale 1" = 200'
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