

# PATHWAYS CONSULTING, LLC

Planning • Civil & Environmental Engineering • Surveying • Construction Assistance  
240 Mechanic Street • Suite 100  
Lebanon, New Hampshire 03766  
(603) 448-2200 • Fax: (603) 448-1221

---

December 7, 2021

Jamie Teague, Business Administrator  
Norwich School District  
41 Lebanon Street #2  
Hanover, New Hampshire 03755

RE: REVISED CONCEPTUAL ALTERNATIVES FOR WASTEWATER DISPOSAL FOR  
MARION CROSS SCHOOL, NORWICH, VERMONT (Project No. 11647)

Dear Jamie:

We have utilized the October 21, 2021 letter report from Lincoln Applied Geology (LAG), represented by Steve Revell, Certified Professional Geologist (CPG) to consider the conceptual requirements and costs for on-site wastewater disposal systems (systems) on the Dresden Recreation Fields (DRF) property adjacent to Route 5 in Norwich. The LAG report identifies Areas 1, 2, and 3 with conceptual wastewater disposal capacities of 11,500 gallons per day (gpd), 2,300 gpd, and 1,500 gpd, respectively, for potential systems. The potential capacity of the areas LAG identified appear to significantly exceed the needs of the Norwich School District (District) with current flows that may be as low as 2,500 gpd. The District will need to determine desired flows for system analysis and permitting on the DRF because the Vermont Agency of Natural Resources (VANR) has different regulations for wastewater disposal when flows are less than 6,500 gpd and for flows of 6,500 gpd or more.

As noted in our November 4, 2019 conceptual analysis summary, we understand the District revised its wastewater disposal permit with the VANR on March 23, 2008 under permit WW-3-0026-R to accommodate a reduction in flow to 5,460 gpd for 364 students and staff. The current District permit is governed by VANR Department of Environmental Conservation, Drinking Water and Groundwater Protection Division, Environmental Protection Rules, Chapter 1, Wastewater System and Potable Water Supply Rules (Rules), effective April 12, 2019. Flows of 6,500 gpd or more will require an Indirect Discharge Permit (IDP) in accordance with Chapter 14, Indirect Discharge Rules, also effective April 12, 2019. The IDP program is rigorous and will require a great deal more evaluation than current Marion Cross School (MCS) permit requirements, likely with LAG in the lead to manage regulator guidance as data evolve through ongoing site investigations. The difference between the Rules and the IDP program will determine time, cost, and permitting needs, which might be further complicated if the District changes course during project review.

Section 1-803 of the Rules provides flows for various uses to assist with evaluating possible flow needs for DRF property. The Rules require 3 gpd for each spectator and 4 gpd for each participant for "Sports Arena; Skating Rink; Soccer Field; Tennis Court; Pools; Hot Tubs; Saunas; Spas; Health Club; Exercise Gym; Dance Studio; Similar Facility." Taking the higher requirement for up to 200 people per day suggests rest rooms serving the DRF require 800 gpd. Although we understand that it may be desirable to have a cafe-type facility at the DRF, we need more direction to consider wastewater flows and needs. Given our understanding of current MCS flows, it appears that adding the DRF conceptual needs to the existing District needs will generate flows that would require permitting by the Rules and not the IDP program

requirements. We need to better understand the District's expansion goals, including Pre-K and other programs, along with additional uses at the DRF to confirm regulatory requirements.

We assisted LAG with evaluation of the DRF property this year including observation of test pits on May 4, 2021 with Steve Revell; archival review and use of our previous test pit evaluations on June 21, 2000; development of a base plan using publicly available information from the Vermont Center for Geographic Information (VCGI) to present LiDAR topography relative to existing facilities and the property boundary; and field surveying to locate new test pits while establishing actual ground elevations at each test pit to confirm the relative accuracy of LiDAR topography. Figure A (attached) is intended to graphically represent system components based on LAG's initial evaluation results including schematic diagrams of the Area 1 application area with dimensions of 25.4 feet by 400 feet, the Area 2 application area with dimensions of 20 feet by 100 feet, and the Area 3 application area with dimensions of 28 feet by 100 feet. Each of the application areas is served by a generic flow control structure and forcemain from Route 5. Since effluent from the District will be delivered to the DRF under pressure, we assume it will be necessary to manage flows through flow equalization (likely weirs) at the DRF with pumping facilities for each of the application areas. Flow control at each application area needs to be determined and the diagram information on this figure will change as we learn more about the site, regulatory requirements, and begin preliminary design.

Use of the DRF for District needs does not require a potable water supply, but we assume restroom and related facilities for spectators and participants will require potable water. The basic alternatives for water supply would include drilling a well or connection to the Town of Hartford (Hartford) water line in Olcott Drive. Installation of a well will require understanding desired facility locations and wastewater flows to plan mechanical needs and address isolation distances, which must be calculated as a function of wastewater flows. While it is our recollection that the DRF include a utility easement for a possible connection to the Hartford water main, this should be confirmed. A connection to the Hartford municipal system will, of course, require local and State approvals for implementation and an agreement with Hartford relative to use and cost. We have not included water supply on diagrams for project options nor have we evaluated the cost for water supply options.

Figure B (attached) shows schematic routing and facilities to send wastewater from MCS to the DRF and includes alternatives that provide a connection to both the Towns of Hartford and Hanover for the purpose of comparison. The MCS uses, flows, and campus appurtenances to connect to a forcemain for off-site wastewater disposal have not been defined beyond new septic tanks and a pump station for current flows; future uses will likely increase flows and may warrant mechanical modifications and grease management for food service. We have continued to show a 2-inch diameter forcemain for MCS use with the understanding that the 1.5-inch pipe is the minimum diameter allowed by the State regulations, which is predicated on cleansing velocity. The connection to Hartford remains the same as our previous diagram with a generic forcemain to pump station connection within the Olcott Industrial Park. The connection to Hanover includes a forcemain from MCS along Routes 5 and 10A to a Ledyard Bridge crossing and a forcemain to pump station connection at Tuck Drive. In this context, we offer:

Option 1: This option considers District and DRF needs for a system that would be permitted by the Rules for flows less than 6,500 gpd. This option considers a system based on the Rules for only MCS and DRF needs with an application rate of 1.0 gpd/square foot (SF). We assume that this option would require a water supply.

Option 2: This option considers a Hartford municipal connection as a long term solution for wastewater disposal.

Option 3: This option considers a Town of Hanover municipal connection as a long term solution for wastewater disposal.

Option 4: This option considers a DRF solution in concert with one or more of the existing commercial uses along Route 5 for flows in excess of 6,500 gpd pursuant to IDP requirements including pretreatment for an application rate of 2.0 gpd/SF. We assume that this option would require a water supply.

The attached conceptual Engineer's Opinion of Probable Cost (EOPC) for each option is predicated on the assumptions listed as items based on our experience with similar projects. This approach seeks to refine our previous general cost considerations for relative cost understanding by lending more depth to the likely project components listed as items. It remains important to note that evaluation of options and costs remains conceptual in nature since we do not have the benefit of design or regulatory input. We would also like to note that material costs and availability continue to vary widely in the current COVID-19 and supply chain paradigm. Additionally, we have not included a contingency or design and construction administration costs since all will vary based on the regulations governing the project and the funding source requirements. At the conceptual level, we frequently suggest a contingency of 20% to 25%. Although design and construction administration costs typically range from 10% to 15% each, a public funding process such as the State Revolving Fund (SRF) will require more effort during project design for documentation and compliance with funding rules. The refined EOPCs should enable a relative comparison between options to inform decision making and funding alternatives.

From our discussions with the District to date, we understand that it will be important to evaluate Town of Norwich (Norwich) wastewater objectives relative to District needs. While the District's immediate needs are the basis for our work to date, we understand the District may desire an assessment of infrastructure options for expansion if Norwich proposes wastewater service for some portion of the Village. From our interaction with Norwich Fire District representatives, we understand that daily water use for the Village ranges from approximately 60,000 gpd to 80,000 gpd. Pipe sizing for the forcemain from MCS and/or the Village to any disposal location needs to consider cleansing velocity with many possible options for pumping, storage, and off-cycle system operation coordination. To evaluate expansion potential, we will need to work with the District to make basic assumptions, which can likely be updated and modified up to the time of project implementation.

For the purpose of suggesting next steps, we assume that use of the DRF will be the basis of our ongoing assistance. In this context, we offer the following steps:

1. Coordinate with the Dresden School District: The District will need to confirm with the Dresden School District that the DRF may be used for on-site wastewater disposal.
2. Determine Uses and Flows: The District will need to determine both short term and long term uses at MCS and facilities desired at the DRF. An understanding of uses and flows will allow us to refine steps and focus on design and permitting.

3. Memorandum of Understanding (MOU) with Others: If the District intends to partner with one or more of the existing businesses along Route 5, an MOU will be required to clearly define roles and responsibilities.
4. Further Hydrogeological and Site Evaluation: Regardless of the permitting process, we will need to work with LAG to conduct further assessment of the site, define system capacity, and develop design parameters. If the District partners with King Arthur Bakery (KAB), LAG will need to begin discussions with regulators to establish IDP program requirements for this site and develop a corresponding work plan. For perspective, we anticipate that the work plan will continue to evolve as we learn more about the site and project needs. This task will need to include understanding KAB flows and treatment needs.
5. Identify Permitting Requirements: In addition to wastewater permitting, we assume that Norwich and Vermont Agency of Transportation (VTrans) permitting will be necessary for utility work within public rights-of-way. Depending on the actual project and approach, other agencies may need to be engaged for permitting.
6. Design and Permitting: Once the project is defined, design and permitting may begin. This task typically includes schematic design for regulator interaction, preliminary design, and final design for approvals. This task will include ongoing EOPCs with each stage of project design.
7. Project Construction: This task will likely include developing bidding documents, soliciting bids, contractor selection, and construction. If public funding (beyond District resources) is used for the project, bid documents will need to include appropriate provisions.

Until we know more about the actual project scope, it will be difficult to suggest timing for project tasks. The key issue from our perspective is identification of flows so that LAG can develop a hydrogeological work plan that will likely need to consider winter conditions. Even though work will likely continue in the spring, Steve Revell can coordinate with regulators over the winter to inform his work plan and begin seeking input about schematic design. Important timing considerations will also be a function of steps outlined above. For instance, defining project flows and uses along with completing necessary MOUs will be needed for anything more than MCS flows; the sooner these tasks are completed, the sooner we can begin schematic design development and permitting coordination. We offer the following general time considerations without consideration of bond votes, public hearing and notification requirements, and other ancillary tasks that will effect project timing:

1. Schematic Design: Working with the District, KAB, LAG, and regulators to define project parameters and develop schematic plans. With working relationships established and focused team effort, identification of permitting requirements and schematic design should will require three to four months. This time frame can also be used to gather more project information for hydrogeological needs, right-of-way, environmental evaluations, topographic surveying where appropriate to supplement LiDAR work to date, borings, and any specialty considerations for the project such as KAB pretreatment, telemetry and electrical needs, and structural or geotechnical needs.

2. Design and Permitting: Without knowing actual project requirements and components, we suggest allocating approximately six months for design and permitting. If a funding program such as SRF, ARPA, CDBG, or USDA RD is involved, permitting may take longer. At this juncture, our assumption is that VTrans will need to issue a State Highway Access and Work permit pursuant to 19 VSA 1111, which we assume may be issued relatively quickly for utility work.
3. Construction Bidding and Contractor Selection: Development of bid documents, bidding, and contractor selection warrants allocating two to three months once design and permitting are complete.
4. Construction: We anticipate that this project will require six to twelve months because of the lead time that will be necessary for mechanical components such as pumps and telemetry. Our current experience with supply chain issues may exacerbate timing by adding at least three or four months to construction duration, which needs to be contemplated with contract award, particularly if penalties for delays are desired.

Please let us know if you have any questions about our updated summary of project considerations.

Sincerely,

PATHWAYS CONSULTING, LLC.

Jeffrey S. Goodrich, P.E.  
President

JSG:sef

Enclosures



REVISION NO.	DATE	DESCRIPTION	MADE BY	CHECKED BY	APPROVED BY

ON-SITE WASTEWATER DISPOSAL AREAS FOR  
**MARION CROSS SCHOOL**  
 NORWICH, VERMONT

**PATHWAYS CONSULTING, LLC**  
 240 MECHANIC STREET, SUITE 100  
 LEBANON, NEW HAMPSHIRE 03766  
 (603) 448-2200

SCALE: AS SHOWN	<b>A</b>
DESIGNED BY: RJF/JSG	
DRAWN BY: DPM	
CHECKED BY: RJF	
DATE: 12-06-21	
PROJ. NO. 10021	SHEET 1 OF 2



REVISION NO.	DATE	DESCRIPTION	MADE BY	CHECKED BY	APPROVED BY

WASTEWATER DISPOSAL ALTERNATIVES FOR  
**MARION CROSS SCHOOL**  
 NORWICH, VERMONT

PATHWAYS CONSULTING, LLC  
 240 MECHANIC STREET, SUITE 100  
 LEBANON, NEW HAMPSHIRE 03766  
 (603) 448-2200

SCALE: AS SHOWN  
 DESIGNED BY: RJF/JSG  
 DRAWN BY: DPM  
 CHECKED BY: RJF  
 DATE: 12-06-21  
 PROJ. NO. 10021

B

SHEET 2 OF 2

**ENGINEER'S CONCEPTUAL OPINION OF PROBABLE COST  
WASTEWATER SYSTEM UPGRADES  
(OPTION 1 DIRECTIONAL DRILLING AND CONSTRUCTING NEW WASTEWATER FIELDS AT DRESDEN ATHLETIC FIELDS)  
5,000 GALLONS PER DAY  
FOR  
SAU # 70 DRESDEN SCHOOL DISTRICT - MARION CROSS SCHOOL  
PREPARED BY PATHWAYS CONSULTING, LLC (Project No. 11647)  
December 7, 2021**

Item Number	Item Description	Estimated Quantity	Unit	Unit Price	Total Price
1.01	Pump Station (Marion Cross School, with 2" Effluent Pump, 5,000 Gallon/Day)	1	AL	\$125,000.00	\$125,000.00
1.02	Backup Generator with Buried Propane Tank (Marion Cross Pump Station)	1	AL	\$30,000.00	\$30,000.00
1.03	Pump Station Controls and Telemetry Allowance	1	AL	\$25,000.00	\$25,000.00
1.04	Septic Tanks (Marion Cross School)	1	AL	\$20,000.00	\$20,000.00
1.05	2" DR11 HDPE Sewer Force main (Open Excavation Allowance, Borings will be Needed to Determine Extent, Assume 10% of Overall Force main Length)	1,000	LF	\$70.00	\$70,000.00
1.06	2" DR11 HDPE Sewer Force main (Directional Drill Method Allowance, Borings will be Needed to Determine Extent, Assume Drilling and Receiving Pits Every 500 LF, Assume 90% of Overall Force main Length)	7,240	LF	\$70.00	\$506,800.00
1.07	Off-site Wastewater System Component (Receiving Manhole)	1	EA	\$5,000.00	\$5,000.00
1.08	Off-site Wastewater System Component (Pump Station with Pump Chamber, and Backup Emergency Storage)	1	AL	\$100,000.00	\$100,000.00
1.09	Off-site Wastewater System Component (Flow Control Structures Each Field with Valves)	1	EA	\$7,500.00	\$7,500.00
1.10	Off-site Wastewater System Component (1 Wastewater Fields, Various Sizes)	10,560	SF	\$25.00	\$264,000.00
1.11	Off-site Wastewater System (Clearing and Grubbing)	1	AL	\$7,500.00	\$7,500.00
1.12	Off-site Wastewater System (Construction/Permanent Stabilized Access Allowance)	1	AL	\$7,500.00	\$7,500.00
1.13	Off-site Wastewater System (Grading Allowance)	1	AL	\$7,500.00	\$7,500.00
1.14	Off-site Wastewater System (Restoration of Vegetation)	1	AL	\$7,500.00	\$7,500.00
1.15	Remove and Dispose of Existing Pavement, Full Depth (Saw-cutting is incidental, Assume 10% of Force main Length in Road)	1,150	SY	\$10.00	\$11,500.00
1.16	Rock Excavation (Allowance, Borings will be Needed to Determine Extent)	500	CY	\$150.00	\$75,000.00
1.17	Exploratory Excavation	1	AL	\$10,000.00	\$10,000.00
1.18	Sewer Force main Valve Manhole with Air Release (Allowance)	4	EA	\$11,500.00	\$46,000.00
1.19	Sewer Force main Two-way Cleanout Manhole (Allowance)	4	EA	\$12,000.00	\$48,000.00
1.20	4' Diameter Sewer Manhole with Frame and Cover to Receive Service from School Prior to Pump Station	1	EA	\$5,500.00	\$5,500.00
1.21	Crushed Existing Tanks and Pump System in Place and Abandon Leach Field in Place	1	AL	\$15,000.00	\$15,000.00
1.22	6" SDR35 PVC Gravity Sewer Main, Allowance	100	LF	\$60.00	\$6,000.00
1.23	Roadway Gravel Replacement (24" Thickness, Assume 10% of Force main Length in Roadway)	775	CY	\$40.00	\$31,000.00
1.24	Bituminous Concrete Pavement Patch, (Assume 5" Thickness in Roadway, Assume 10% of Force main Length in Roadway)	1,150	SY	\$38.00	\$43,700.00

1.25	Temporary Bituminous Concrete Pavement Allowance	1	AL	\$25,000.00	\$25,000.00
1.26	Restoration of Growth of Lawns and Grasses	1	LS	\$8,000.00	\$8,000.00
1.27	Maintenance of Traffic	1	LS	\$25,000.00	\$25,000.00
1.28	Flaggers Hour	1,000	HOURS	\$40.00	\$40,000.00
1.29	Dewatering (Inclusive of Silt Sack Dewatering Bags, Pumps, Controls)	1	AL	\$15,000.00	\$15,000.00
1.30	Miscellaneous Erosion Control Allowance (EPSC Plan, Implementation and Maintenance)	1	AL	\$35,000.00	\$35,000.00
1.31	Mobilization/Demobilization (Assume 7.5% of Construction Cost)	1	LS	\$121,725.00	\$121,725.00
1.32	Miscellaneous Work and Cleanup (Assume 2.5% of Construction Cost)	1	LS	\$40,575.00	\$40,575.00
<b>Subtotal</b>					<b>\$1,785,300.00</b>

Note: This Engineer's Conceptual Opinion of Probable Cost (EOPC) was established from the Conceptual Site Plans prepared by Pathways Consulting, LLC, dated December, 2021. In providing this EOPC, the Client understands that Pathways Consulting, LLC (Pathways) has no control over the unit costs or availability of labor, equipment or materials, market conditions, or the Contractor's method of pricing. This EOPC was developed on the basis of experience with similar projects, including current unit prices that have been received by Pathways for similar projects. Pathways makes no warranty, express or implied, that the bid, or the negotiated cost of the work for this project will not vary from this EOPC. Upon completion of a geotechnical investigation, formal design drawings, permitting, determination of funding source, and prior to construction of the project, Pathways may revise this EOPC to reflect actual design parameters and updated construction costs.

DRAFT

**ENGINEER'S CONCEPTUAL OPINION OF PROBABLE COST  
WASTEWATER SYSTEM UPGRADES  
(OPTION 2 DIRECTIONAL DRILLING AND CONNECTING AT HARTFORD PUMP STATION - OLCOTT DRIVE)  
FOR  
SAU # 70 DRESDEN SCHOOL DISTRICT - MARION CROSS SCHOOL  
PREPARED BY PATHWAYS CONSULTING, LLC (Project No. 11647)  
December 7, 2021**

Item Number	Item Description	Estimated Quantity	Unit	Unit Price	Total Price
1.01	Pump Station (Marion Cross School, with 2" Grinder Pump, 5,000 Gallon/Day)	1	AL	\$125,000.00	\$125,000.00
1.02	Backup Generator with Buried Propane Tank (Marion Cross Pump Station)	1	AL	\$30,000.00	\$30,000.00
1.03	Pump Station Controls and Telemetry Allowance	1	AL	\$25,000.00	\$25,000.00
1.04	2" DR11 HDPE Sewer Force main (Open Excavation Allowance, Borings will be Needed to Determine Extent, Assume 10% of Overall Force main Length)	830	LF	\$70.00	\$58,100.00
1.05	2" DR11 HDPE Sewer Force main (Directional Drill Method Allowance, Borings will be Needed to Determine Extent, Assume Drilling and Receiving Pits Every 500 LF, Assume 90% of Overall Force main Length)	7,470	LF	\$70.00	\$522,900.00
1.06	Remove and Dispose of Existing Pavement, Full Depth (Saw-cutting is incidental, Assume 10% of Force main Length in Roadway)	925	SY	\$10.00	\$9,250.00
1.07	Rock Excavation (Allowance, Borings will be Needed to Determine Extent)	500	CY	\$150.00	\$75,000.00
1.08	Exploratory Excavation	1	AL	\$10,000.00	\$10,000.00
1.09	Sewer Force main Valve Manhole with Air Release (Allowance)	5	EA	\$11,500.00	\$57,500.00
1.10	Sewer Force main Two-way Cleanout Manhole (Allowance)	5	EA	\$12,000.00	\$60,000.00
1.11	Sewer Force main Interconnection Allowance at Olcott Drive.	1	AL	\$15,000.00	\$15,000.00
1.12	Existing Receiving Pump Station Improvements at Olcott Drive Allowance.	1	AL	\$40,000.00	\$40,000.00
1.13	4' Diameter Sewer Manhole with Frame and Cover to Receive Service from School Prior to Pump Station	1	EA	\$5,500.00	\$5,500.00
1.14	Crushed Existing Tanks and Pump System in Place and Abandon Leach Field in Place	1	AL	\$15,000.00	\$15,000.00
1.15	6" SDR35 PVC Gravity Sewer Main, Allowance	100	LF	\$60.00	\$6,000.00
1.16	Roadway Gravel Replacement (24" Thickness, Assume 10% of Force main Length in Roadway)	620	CY	\$40.00	\$24,800.00
1.17	Bituminous Concrete Pavement Patch, (Assume 5" Thickness In Roadway, Assume 10% of Force main Length in Roadway)	925	SY	\$38.00	\$35,150.00
1.18	Temporary Bituminous Concrete Pavement Allowance	1	AL	\$20,000.00	\$20,000.00
1.19	Restoration of Growth of Lawns and Grasses	1	LS	\$8,000.00	\$8,000.00
1.20	Maintenance of Traffic	1	LS	\$30,000.00	\$30,000.00
1.21	Flaggers Hour	1,000	HOURS	\$40.00	\$40,000.00
1.22	Dewatering (Inclusive of Silt Sack Dewatering Bags, Pumps, Controls)	1	AL	\$15,000.00	\$15,000.00
1.23	Miscellaneous Erosion Control Allowance (EPSC Plan, Implementation and Maintenance)	1	LS	\$25,000.00	\$25,000.00

1.24	Mobilization/Demobilization (Assume 7.5% of Construction Cost)	1	LS	\$93,915.00	\$93,915.00
1.25	Miscellaneous Work and Cleanup (Assume 2.5% of Construction Cost)	1	LS	\$31,305.00	\$31,305.00
				<b>Subtotal</b>	<b>\$1,377,420.00</b>

Note: This Engineer's Conceptual Opinion of Probable Cost (EOPC) was established from the Conceptual Site Plans prepared by Pathways Consulting, LLC, dated December, 2021. In providing this EOPC, the Client understands that Pathways Consulting, LLC (Pathways) has no control over the unit costs or availability of labor, equipment or materials, market conditions, or the Contractor's method of pricing. This EOPC was developed on the basis of experience with similar projects, including current unit prices that have been received by Pathways for similar projects. Pathways makes no warranty, express or implied, that the bid, or the negotiated cost of the work for this project will not vary from this EOPC. Upon completion of a geotechnical investigation, formal design drawings, permitting, determination of funding source, and prior to construction of the project, Pathways may revise this EOPC to reflect actual design parameters and updated construction costs.



**ENGINEER'S CONCEPTUAL OPINION OF PROBABLE COST  
WASTEWATER SYSTEM UPGRADES  
(OPTION 3 DIRECTIONAL DRILLING AND CONNECTING AT HANOVER PUMP STATION - OLD TUCK DRIVE  
FOR  
SAU # 70 DRESDEN SCHOOL DISTRICT - MARION CROSS SCHOOL  
PREPARED BY PATHWAYS CONSULTING, LLC (Project No. 11647)  
December 7, 2021**

Item Number	Item Description	Estimated Quantity	Unit	Unit Price	Total Price
1.01	Pump Station (Marion Cross School, with 2" Grinder Pump, 5,000 Gallon/Day)	1	AL	\$125,000.00	\$125,000.00
1.02	Backup Generator with Buried Propane Tank (Marion Cross Pump Station)	1	AL	\$30,000.00	\$30,000.00
1.03	Pump Station Controls and Telemetry Allowance	1	AL	\$25,000.00	\$25,000.00
1.04	2" DR11 HDPE Sewer Force main (Open Excavation Allowance, Borings will be Needed to Determine Extent, Assume 10% of Overall Force main Length)	520	LF	\$70.00	\$36,400.00
1.05	2" DR11 HDPE Sewer Force main (Directional Drill Method Allowance, Borings will be Needed to Determine Extent, Assume Drilling and Receiving Pits Every 500 LF, Assume 90% of Overall Force main Length)	4,580	LF	\$70.00	\$320,600.00
1.06	2"DI Force main on Ledyard Bridge with Hangers (End of Approach Slab to End of Approach Slab)	600	LF	\$600.00	\$360,000.00
1.07	Remove and Dispose of Existing Pavement, Full Depth (Saw-cutting is incidental, Assume 10% of Force main Length in Roadway)	580	SY	\$10.00	\$5,800.00
1.08	Rock Excavation (Allowance, Borings will be Needed to Determine Extent)	500	CY	\$150.00	\$75,000.00
1.09	Exploratory Excavation	1	AL	\$10,000.00	\$10,000.00
1.10	Sewer Force main Valve Manhole with Air Release (Allowance)	3	EA	\$11,500.00	\$34,500.00
1.11	Sewer Force main Two-way Cleanout Manhole (Allowance)	3	EA	\$12,000.00	\$36,000.00
1.12	Sewer Force main Interconnection into Existing Pump Station at Old Tuck Drive	1	AL	\$25,000.00	\$25,000.00
1.13	Existing Receiving Pump Station Improvements at Old Tuck Drive	1	AL	\$10,000.00	\$10,000.00
1.14	4' Diameter Sewer Manhole with Frame and Cover to Receive Service from School Prior to Pump Station	1	EA	\$5,500.00	\$5,500.00
1.15	Crushed Existing Tanks and Pump System in Place and Abandon Leach Field in Place	1	AL	\$15,000.00	\$15,000.00
1.16	6" SDR35 PVC Gravity Sewer Main, Allowance	100	LF	\$60.00	\$6,000.00
1.17	Ledyard Bridge Approach Slab Allowance and Sleeve Access Allowance	1	AL	\$50,000.00	\$50,000.00
1.18	Railroad Right-of-Way Construction Allowance (May Have Additional Requirements and Bonds)	1	AL	\$50,000.00	\$50,000.00
1.19	Roadway Gravel Replacement (24" Thickness, Assume 10% of Force main Length in Roadway)	390	CY	\$40.00	\$15,600.00
1.20	Bituminous Concrete Pavement Patch, (Assume 5" Thickness In Roadway, Assume 10% of Force main Length in Roadway)	580	SY	\$38.00	\$22,040.00
1.21	Temporary Bituminous Concrete Pavement Allowance	1	AL	\$15,000.00	\$15,000.00
1.22	Restoration of Growth of Lawns and Grasses	1	LS	\$8,000.00	\$8,000.00
1.23	Maintenance of Traffic	1	LS	\$55,000.00	\$55,000.00
1.24	Flaggers Hour	1,000	HOURS	\$40.00	\$40,000.00
1.25	Dewatering (Inclusive of Silt Sack Dewatering Bags, Pumps, Controls)	1	AL	\$15,000.00	\$15,000.00
1.26	Miscellaneous Erosion Control Allowance (EPSC Plan, Implementation and Maintenance)	1	AL	\$25,000.00	\$25,000.00

1.27	Mobilization/Demobilization (Assume 7.5% of Construction Cost)	1	LS	\$106,158.00	\$106,158.00
1.28	Miscellaneous Work and Cleanup (Assume 2.5% of Construction Cost)	1	LS	\$35,386.00	\$35,386.00
				<b>Subtotal</b>	<b>\$1,556,984.00</b>

Note: This Engineer's Conceptual Opinion of Probable Cost (EOPC) was established from the Conceptual Site Plans prepared by Pathways Consulting, LLC, dated December, 2021. In providing this EOPC, the Client understands that Pathways Consulting, LLC (Pathways) has no control over the unit costs or availability of labor, equipment or materials, market conditions, or the Contractor's method of pricing. This EOPC was developed on the basis of experience with similar projects, including current unit prices that have been received by Pathways for similar projects. Pathways makes no warranty, express or implied, that the bid, or the negotiated cost of the work for this project will not vary from this EOPC. Upon completion of a geotechnical investigation, formal design drawings, permitting, determination of funding source, and prior to construction of the project, Pathways may revise this EOPC to reflect actual design parameters and updated construction costs.

DRAFT

**ENGINEER'S CONCEPTUAL OPINION OF PROBABLE COST  
WASTEWATER SYSTEM UPGRADES  
(OPTION 4 DIRECTIONAL DRILLING AND CONSTRUCTING NEW WASTEWATER FIELDS AT DRESDEN ATHLETIC FIELDS)  
15,000 GPD WITH PRE-TREATMENT  
FOR  
SAU # 70 DRESDEN SCHOOL DISTRICT - MARION CROSS SCHOOL  
PREPARED BY PATHWAYS CONSULTING, LLC (Project No. 11647)  
December 7, 2021**

Item Number	Item Description	Estimated Quantity	Unit	Unit Price	Total Price
1.01	Pump Station (Marion Cross School, with 2" Effluent Pump, 5,000 Gallon/Day)	1	AL	\$125,000.00	\$125,000.00
1.02	Backup Generator with Buried Propane Tank (Marion Cross Pump Station)	1	AL	\$30,000.00	\$30,000.00
1.03	Pump Station Controls and Telemetry Allowance	1	AL	\$25,000.00	\$25,000.00
1.04	Septic Tanks (Marion Cross School)	1	AL	\$20,000.00	\$20,000.00
1.05	2" DR11 HDPE Sewer Force main (Open Excavation Allowance, Borings will be Needed to Determine Extent, Assume 10% of Overall Force main Length)	1,000	LF	\$70.00	\$70,000.00
1.06	2" DR11 HDPE Sewer Force main (Directional Drill Method Allowance, Borings will be Needed to Determine Extent, Assume Drilling and Receiving Pits Every 500 LF, Assume 90% of Overall Force main Length)	9,140	LF	\$70.00	\$639,800.00
1.07	Off-site Wastewater System Component (Receiving Manhole)	1	EA	\$5,000.00	\$5,000.00
1.08	Off-site Wastewater System Component (Pre-Treatment Allowance)	1	AL	\$40,000.00	\$40,000.00
1.08	Off-site Wastewater System Component (Weir Structure)	1	EA	\$12,000.00	\$12,000.00
1.09	Off-site Wastewater System Component (Pump Station with 3 Pump Chambers, and Backup Emergency Storage)	1	AL	\$125,000.00	\$125,000.00
1.10	Off-site Wastewater System Component (Flow Control Structures Each Field with Valves)	3	EA	\$7,500.00	\$22,500.00
1.11	Off-site Wastewater System Component (3 Wastewater Fields, Various Sizes)	15,360	SF	\$25.00	\$384,000.00
1.12	Off-site Wastewater System (Clearing and Grubbing)	1	AL	\$10,000.00	\$10,000.00
1.13	Off-site Wastewater System (Construction/Permanent Stabilized Access Allowance)	1	AL	\$7,500.00	\$7,500.00
1.14	Off-site Wastewater System (Grading Allowance)	1	AL	\$7,500.00	\$7,500.00
1.15	Off-site Wastewater System (Restoration of Vegetation)	1	AL	\$7,500.00	\$7,500.00
1.16	Remove and Dispose of Existing Pavement, Full Depth (Saw-cutting is incidental, Assume 10% of Force main Length in Road)	1,150	SY	\$10.00	\$11,500.00
1.17	Rock Excavation (Allowance, Borings will be Needed to Determine Extent)	500	CY	\$150.00	\$75,000.00
1.18	Exploratory Excavation	1	AL	\$10,000.00	\$10,000.00
1.19	Sewer Force main Valve Manhole with Air Release (Allowance)	4	EA	\$11,500.00	\$46,000.00
1.20	Sewer Force main Two-way Cleanout Manhole (Allowance)	4	EA	\$12,000.00	\$48,000.00
1.21	4' Diameter Sewer Manhole with Frame and Cover to Receive Service from School Prior to Pump Station	1	EA	\$5,500.00	\$5,500.00
1.22	Crushed Existing Tanks and Pump System in Place and Abandon Leach Field in Place	1	AL	\$15,000.00	\$15,000.00
1.23	6" SDR35 PVC Gravity Sewer Main, Allowance	100	LF	\$60.00	\$6,000.00
1.24	Roadway Gravel Replacement (24" Thickness, Assume 10% of Force main Length in Roadway)	775	CY	\$40.00	\$31,000.00
1.25	Bituminous Concrete Pavement Patch, (Assume 5" Thickness in Roadway, Assume 10% of Force main Length in Roadway)	1,150	SY	\$38.00	\$43,700.00

1.26	Temporary Bituminous Concrete Pavement Allowance	1	AL	\$25,000.00	\$25,000.00
1.27	Restoration of Growth of Lawns and Grasses	1	LS	\$8,000.00	\$8,000.00
1.28	Maintenance of Traffic	1	LS	\$25,000.00	\$25,000.00
1.29	Flaggers Hour	1,000	HOURS	\$40.00	\$40,000.00
1.30	Dewatering (Inclusive of Silt Sack Dewatering Bags, Pumps, Controls)	1	AL	\$15,000.00	\$15,000.00
1.31	Miscellaneous Erosion Control Allowance (EPSC Plan, Implementation and Maintenance)	1	AL	\$35,000.00	\$35,000.00
1.32	Mobilization/Demobilization (Assume 7.5% of Construction Cost)	1	LS	\$147,787.50	\$147,787.50
1.33	Miscellaneous Work and Cleanup (Assume 2.5% of Construction Cost)	1	LS	\$49,262.50	\$49,262.50
<b>Subtotal</b>					<b>\$2,167,550.00</b>

Note: This Engineer's Conceptual Opinion of Probable Cost (EOPC) was established from the Conceptual Site Plans prepared by Pathways Consulting, LLC, dated December, 2021. In providing this EOPC, the Client understands that Pathways Consulting, LLC (Pathways) has no control over the unit costs or availability of labor, equipment or materials, market conditions, or the Contractor's method of pricing. This EOPC was developed on the basis of experience with similar projects, including current unit prices that have been received by Pathways for similar projects. Pathways makes no warranty, express or implied, that the bid, or the negotiated cost of the work for this project will not vary from this EOPC. Upon completion of a geotechnical investigation, formal design drawings, permitting, determination of funding source, and prior to construction of the project, Pathways may revise this EOPC to reflect actual design parameters and updated construction costs.

DRAFT