

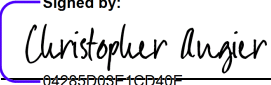
QAPP Worksheet #1 & 2 – Title and Approval Page

1. Project Identifying Information

- a. **Site name/project name:** Saint-Gobain Performance Plastics Sites located at 14 McCaffrey Street (McCaffrey Street Site) and 1 Liberty Street (Liberty Street Site), in Hoosick Falls, New York
- b. **Site location/number:** Hoosick Falls / NYSDEC Site No. 442046 and Site No. 442048

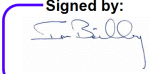
2. Lead Organization

- a. **Lead Organization:** Saint-Gobain Performance Plastics
 - i. **Project Manager (name/title/signature/date):**

Signed by:

04285D63E1CD40E... July 29, 2026 | 12:42 PM PDT
Christopher Angier, Environmental Project Manager Date

- 3. **State Regulatory Agency:** New York State Department of Environmental Conservation (NYSDEC) Division of Environmental Remediation (DER),

- i. **Project Manager (name/title/signature/date):**

Signed by:

09AEC9254C914D6... October 14, 2026 | 7:55 AM PDT
Ian Beilby, P.E., Section Chief, Section C, Remedial Date
Bureau D (Special Projects)

4. Other Stakeholders (as needed)

- a. **Consulting Engineers:** C.T. Male Associates Engineering, Surveying, Architecture, Landscape Architecture & Geology, D.P.C. (C.T. Male Associates)

- i. **Project Principal (name/title/signature/date):**

Signed by:

BB1F26E9DB10411... July 27, 2026 | 6:15 AM PDT
Daniel Reilly, P.E. / President and Chief Executive Date
Officer

ii. Project Manager (name/title/signature/date):

Signed by:



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Jonathan Dippert, P.G. (NY) /
Environmental Services Manager

July 22, 2026 | 1:39 PM PDT

Date

iii. Health & Safety Manager (name/title/signature/date):

Signed by:



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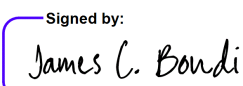
Nancy Garry, P.E., CSP / Sr. Environmental Engineer

July 22, 2026 | 10:45 AM PDT

Date

iv. Field Services Manager (name/title/signature/date):

Signed by:



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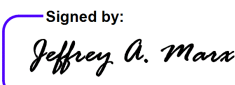
James C. Bondi, I.G. / Geologist III

July 27, 2026 | 7:10 AM PDT

Date

v. Quality Assurance (QA) Manager (name/title/signature/date):

Signed by:



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Jeffrey Marx, P.E. / Sr. Environmental Engineer

July 31, 2026 | 7:50 AM PDT

Date

b. Consulting Engineers: BEC Engineering and Geology, P.C. (BEC)

i. Project Principal (name/title/signature/date):

Signed by:



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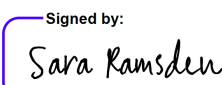
Brian Angerman, P.E. / Sr. Environmental Engineer

July 22, 2026 | 10:37 AM PDT

Date

ii. Project Manager (name/title/signature/date):

Signed by:



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Sara Ramsden, P.E. / Sr. Environmental Engineer

July 22, 2026 | 10:39 AM PDT

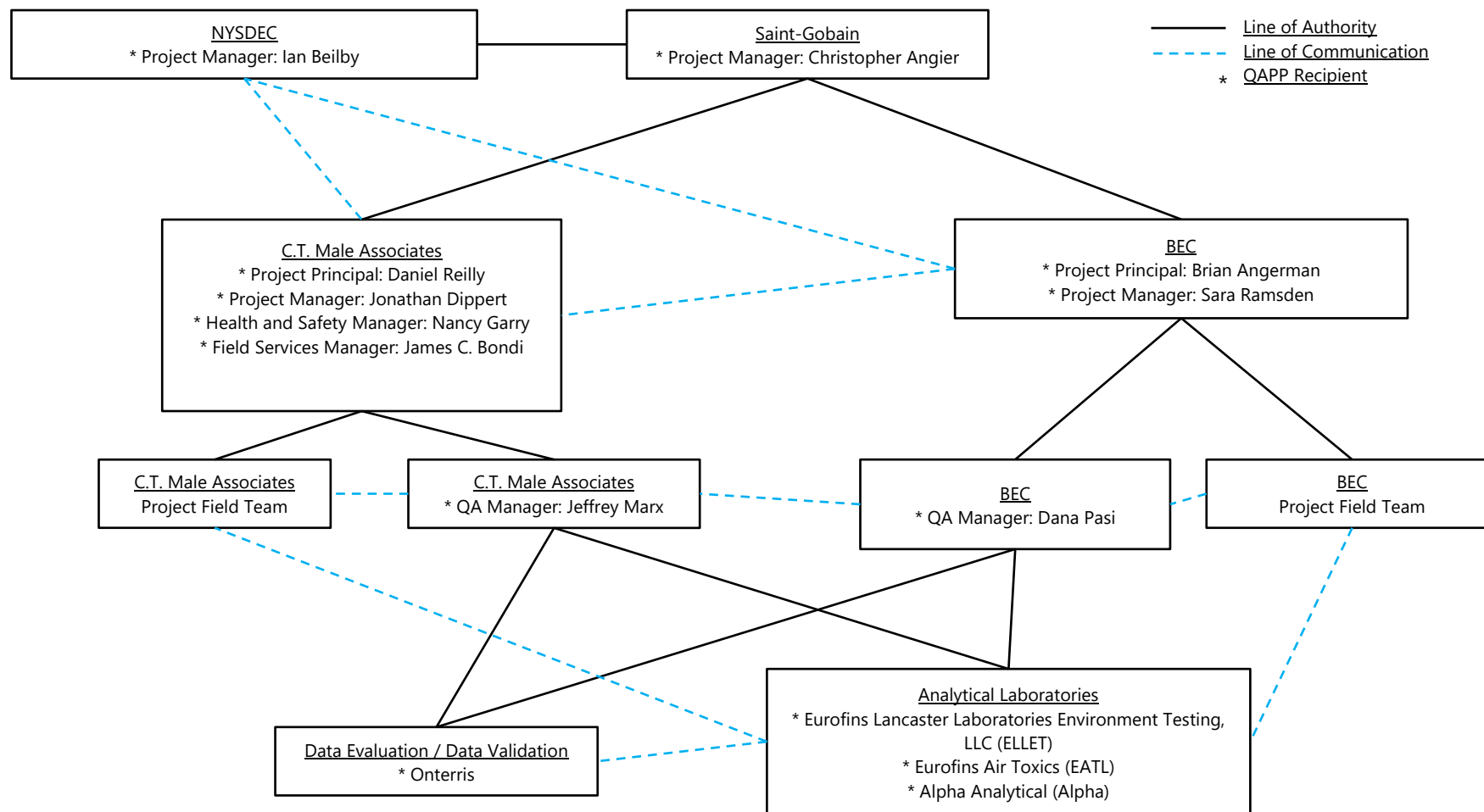
Date

iii. Quality Assurance (QA) Manager (name/title/signature/date):

Signed by:	
	July 23, 2026 1:39 PM PDT
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Dana Pasi, Sr. Environmental Scientist	Date

QAPP Worksheet #3 & 5 – Project Organization and QAPP Distribution

This section identifies the reporting relationships between organizations involved in the project, including the lead organization and contractors and subcontractor organizations. It also includes recipients of controlled copies of the QAPP. Contractors and subcontractors shown on this chart are responsible for document control within their organizations. Site-specific work plans may identify other personnel in similar roles. Email addresses and phone numbers for individuals listed below are provided in QAPP Worksheet #6.



QAPP Worksheet #4, 7 & 8 – Personnel Qualifications and Sign-off Sheet

This section identifies project personnel associated with each organization, contractor, and subcontractor participating in responsible roles. This includes the project manager, QA Manager, project contacts for organizations involved in the project, the project health & safety manager, field operation personnel, and the analytical services provider. This worksheet also lists individuals’ project titles or roles; qualifications; and any specialized/non-routine training, certifications, or clearances required by the project. Signatures indicate personnel have read and agree to implement this QAPP as written and that the QAPP will be kept on-file at each organization.

ORGANIZATION: Eurofins Lancaster Laboratories Environment Testing, LLC of Lancaster, Pennsylvania (ELLET)

Name	Title/Role	Specialized Training/ Certifications	Signature/Date
David Barnhart	Project Manager	Training as required by laboratory QA Manual	Signed by:  August 24, 2026 12:34 PM PDT
Kenneth Boley	QA Manager	Training as required by laboratory QA Manual	DocuSigned by:  July 29, 2026 6:12 AM PDT

QAPP Worksheet #6 – Communication Pathways

Communication pathways for this project are shown below.

Communication Driver	Organization	Name	Contact Information	Procedure (Timing, pathway, etc.)
Regulatory Agency Interface	NYSDEC	Ian Beilby	Office (O): 518-402-9676 ian.beilby@dec.ny.gov	C.T. Male Associates or BEC will contact Saint-Gobain and the regulatory agency (NYSDEC) via email if issues with the implementation of this QAPP occur impacting data quality, when comments to the submittals occur, and when new field sampling plans are identified for implementation.
	C.T. Male Associates	Jonathan Dippert	O: 518-786-7563 j.dippert@ctmale.com	
	BEC	Brian Angerman	O: 952-832-2927 bangerman@bec-mn.com	
	Saint-Gobain	Christopher Angier	O: 518-686-6268 Christopher.Angier@saint-gobain.com	
Laboratory Problems / Corrective Actions	C.T. Male Associates	Jeffrey Marx	O: 518-786-7548 j.marx@ctmale.com	C.T. Male Associates or BEC QA Manager will be the contact for the laboratories should the laboratories experience issues with project samples. Onterris will contact the laboratories if issues are discovered from data validation.
	BEC	Dana Pasi	O: 952-832-2756 dpasi@bec-mn.com	
	Onterris	Bryan J. Eck	O: 610-935-5577 ext. 110230 beck@onterris.com	
	ELLET	David Barnhart	O: 330-805-3885 David.Barnhart@ET.EurofinsUS.com	
	EATL	Brian Whittaker	O: 916-605-3355 BrianWhittaker@eurofinsUS.com	
	Alpha	Christopher Anderson	O: 802-585-5351 canderson@alphalab.com	
Safety Issues	C.T. Male Associates	James C. Bondi	O: 518-786-7492 c.bondi@ctmale.com	C.T. Male Associates field staff will contact the C.T. Male Associates Field Services Manager and/or Health & Safety Manager and BEC field staff will contact the BEC Project Manager. Work may stop until safety issues
		Nancy Garry	O: 518-786-7541 n.garry@ctmale.com	

Communication Driver	Organization	Name	Contact Information	Procedure (Timing, pathway, etc.)
	BEC	Sara Ramsden	O: 952-832-2877 sramsden@bec-mn.com	are cleared. NYSDEC may be contacted if safety issues delay obtaining/reporting of data.
Field Problems / Corrective Actions	C.T. Male Associates	James C. Bondi	O: 518-786-7492 c.bondi@ctmale.com	C.T. Male Associates field staff will contact the C.T. Male Associates Project Manager and/or Field Services Manager and BEC field staff will contact the BEC Project Manager, to discuss difficulties encountered during field activities. They will coordinate with their office's QA Manager, as needed and appropriate. C.T. Male Associates or BEC will contact the regulatory agency (NYSDEC) via email.
		Jonathan Dippert	O: 518-786-7563 j.dippert@ctmale.com	
	BEC	Sara Ramsden	O: 952-832-2877 sramsden@bec-mn.com	
	NYSDEC	Ian Beilby	Office (O): 518-402-9676 ian.beilby@dec.ny.gov	
Field Activity Modifications	NYSDEC	Ian Beilby	O: 518-402-9676 ian.beilby@dec.ny.gov	Saint-Gobain, C.T. Male Associates, and BEC will propose modifications to current sampling program via periodic updates or otherwise as needed. Reduction of testing parameters or frequencies will be performed in consultation with and approval from NYSDEC.
	C.T. Male Associates	James C. Bondi	O: 518-786-7492 c.bondi@ctmale.com	
		Jonathan Dippert	O: 518-786-7563 j.dippert@ctmale.com	
	BEC	Sara Ramsden	O: 952-832-2877 sramsden@bec-mn.com	
	Saint-Gobain	Christopher Angier	O: 518-686-6268 Christopher.Angier@saint-gobain.com	

QAPP Worksheet #12 – Measurement Performance Criteria Table

This worksheet displays the data quality indicator, quality control (QC) activity, matrix group, and measurement performance criteria for both the sampling and analytical measurement systems. Matrix groups may include but are not limited to the following:

- Water – groundwater, surface water (does not include drinking water)
- Solid – soil, sediment
- Air – soil vapor, indoor air, outdoor air

Data Quality Indicator*	QC sample or measurement performance activity	Matrix Group	Measurement Performance Criteria
Precision (field)	Field duplicate samples	Water, solid	Values > 5x reporting limit (RL)/limit of quantitation (LOQ); relative percent difference (RPD) ≤ 30%
Precision (laboratory)	Laboratory duplicate samples or Laboratory control samples (LCS) and LCS duplicates	Water, solid, air	Values > RL/LOQ; method-specific (See Table 2)
Overall accuracy/bias (field and laboratory)/representativeness	Field, equipment, rinsate (rinse) blanks	Water and solid	No target analyte concentrations ≥ RL/LOQ
	Laboratory Trip blanks	Water (VOCs)	
Overall accuracy/bias (laboratory)	Method blanks	Water, solid, air	No target analyte concentrations ≥ RL/LOQ
Analytical accuracy/bias/precision (laboratory)	LCS and LCS duplicates	Water, solid, air	Analyte-specific (See Table 2)
Analytical accuracy/bias/precision (laboratory)	Matrix spike (MS) and Matrix spike duplicate (MSD) samples	Water, solid	Analyte-specific (See Table 2)
Analytical accuracy/bias (laboratory)	Surrogate recoveries	Water, solid	Analyte-specific (See Table 2)
Sensitivity	Samples reported to method detection limit (MDL) (where applicable)	Water, solid, air	Analyte-specific (See Table 2)
Completeness	See Worksheet #34	Water, solid, air	See Worksheet #34

* Laboratory QC is performed as required by the method

QAPP Worksheet #19 & 30 – Sample Containers, Preservation, and Hold Times Table

Sample Parameters, Matrix, Containers, Preservation, Hold Times per Analytical Group

Analytical Group	Matrix	Containers (number, size & type per sample) ⁽¹⁾	Preservation ⁽²⁾	Preparation/ Analytical Holding Time ⁽³⁾
PFAS	Water	Method 537.1 mod - 250 mL high density polyethylene (HDPE)	Cool ≤6°C, Trizma (if chlorine residual present)	14 days until extraction; analysis within 28 days of extraction
		Method 1633A - 500 mL HDPE	Cool ≤6°C	28 days until extraction ⁴ ; analysis within 28 days of extraction
	Solid	Method 537.1 mod - 4.5 oz HDPE jar	Cool ≤6°C	14 days until extraction; analysis within 40 days of extraction
		Method 1633A - 4.5 oz HDPE jar	Cool ≤6°C or ≤ -20 °C	28 days ⁵ at ≤6°C or 90 days ⁵ at ≤ -20 °C
PFAS, SPLP	Solid	4.5 oz HDPE jar	Cool ≤6°C	28 days until leachate or extraction; analysis within 28 days of extraction Note that these holding times may be subject to change based on most current NYSDEC technical guidance.
TCL VOCs	Water	3-40 mL glass volatile organic analysis (VOA) vials	HCl to pH<2, cool ≤6°C, no headspace	14 days (acid preserved), 7 days (unpreserved)
	Solid	Coring device kit (1 methanol and 2 low-level vials w/DI water)	1:1 solvent or zero headspace, cool ≤6°C. Additional unpreserved for %moisture if solvent collection	14 days (methanol), 48 hours from sample collection to analysis or freezing (DI water)
TAL Metals (except mercury)	Water	250 mL plastic	pH <2 HNO ₃	6 months
	Solid	4 oz. glass jar	Cool ≤6°C	6 months
Mercury	Water	250 mL plastic	pH <2 HNO ₃	28 days
	Solid	4 oz. glass jar	Cool ≤6°C	28 days
TOC	Solid	4 oz. glass jar	Cool ≤6°C	28 days
pH	Solid	4 oz. glass jar	Cool ≤6°C	As soon as possible
Moisture, %	Solid	4 oz. glass jar	Cool ≤6°C	Not applicable
TO-15	Air	Evacuated, certified clean canisters	NA	30 days

(1) Container types and sizes listed are for guidance only. Laboratory may use different containers or combine analyses into larger volume containers.

(2) Cool ≤ 6 °C will be chilled using regular ice only.

(3) Holding time starts from date of collection unless otherwise noted.

(4) NMeFOSE, NEtFOSE, NMEFOSAA, NEtFOSAA, and NFDHA are PFAS compounds that are not currently of interest and are only included based on current NYSDEC PFAS sampling guidance. Therefore, no special hold times will be applied for these compounds as listed in the method.

(5) Hold time extended if stored at ≤ -20 °C.

Note: Laboratory standard operating procedures (SOPs) are retained at the place of business and are available upon request for review.

QAPP Worksheet #20 – Field Quality Control Summary

The site-specific work plans and FSP may provide additional detail on the sample type, parameter, frequency, and sampling methods of field QC samples. At a minimum, the following field quality control samples will be collected. See BEC’s SOP ‘Collection of Quality Control Samples’ for further definitions.

Matrix	Analytical Group	No. of Field Duplicate Pairs	No. of MS/MSD	No. of Laboratory Trip Blanks	No. of Equipment Blanks	No. of Rinsate (Rinse) Blanks or Material Checks
Water, solid	All analytical groups	5% of total number sampled or one sample per media, whichever is greater	5% of total number sampled per media	One per cooler for VOC	5% of total number sampled per media or at a minimum of one per day per matrix when decontamination of sampling equipment has occurred.	One per lot/batch of new equipment/material

References

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- C.T. Male Associates, 2016b. Final Remedial Investigation/Feasibility Study Work Plan. Saint-Gobain Performance Plastics, McCaffrey Street Site 14 McCaffrey Street. Village of Hoosick Falls, Rensselaer County. DEC Site No.: 442046. May 2016 revised August 30, 2016.
- C.T. Male Associates, 2016c. Supplemental Investigation. Saint-Gobain Performance Plastics, Liberty Street Site, 1 Liberty Street. Village of Hoosick Falls, Rensselaer County, New York. DEC Site No.: 442048, prepared by C.T. Male Associates. November 22, 2016 (Revised November 29, 2016).
- C.T. Male Associates, 2017a. Liberty Street Site Characterization-Supplemental Investigation. Saint-Gobain Performance Plastics, Liberty Street Site, 1 Liberty Street. Village of Hoosick Falls, Rensselaer County, New York. DEC Site No.: 442048, prepared by C.T. Male Associates. April 26, 2017.
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- C.T. Male Associates, 2017c. Supplemental Scope of Work. Saint-Gobain Performance Plastics, Liberty Street Site, 1 Liberty Street. Village of Hoosick Falls, Rensselaer County, New York. DEC Site No.: 442048, prepared by C.T. Male Associates. May 19, 2017.
- C.T. Male Associates, 2017d. Drum Removal and Exploratory Test Pitting Plan-Final. Saint-Gobain Performance Plastics, Liberty Street Site, 1 Liberty Street. Village of Hoosick Falls, Rensselaer County, New York. DEC Site No.: 442048, prepared by C.T. Male Associates. November 7, 2017.
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- C.T. Male Associates, 2018b. Supplemental Scope of Work, Saint-Gobain Performance Plastics, 14 McCaffrey Street, Village of Hoosick Falls, Rensselaer County, DEC Site No.: 442046. C.T. Male Associates, August 29, 2018.
- C.T. Male Associates, 2018c. Supplemental Scope of Work, Saint-Gobain Performance Plastics Liberty Street Site, 1 Liberty Street, Village of Hoosick Falls, Rensselaer County, New York. DEC Site No.: 442048, prepared by C.T. Male Associates. September 27, 2018.
- C.T. Male Associates, 2019a. Reduction of Groundwater Analytical Parameters and Sampling Frequency. Saint-Gobain Performance Plastics, 1 Liberty Street, Village of Hoosick Falls, Rensselaer County, DEC Site No. 442048. May 17, 2019.

- C.T. Male Associates, 2019b. Reduction of Groundwater Analytical Parameters and Sampling Frequency. Saint-Gobain Performance Plastics, 14 McCaffrey Street, Village of Hoosick Falls, Rensselaer County, DEC Site No. 442046. May 17, 2019.
- C.T. Male Associates, 2019c. Pre-Design Investigation Work Plan and IRM Concept, Saint-Gobain Performance Plastics, 1 Liberty Street, Village of Hoosick Falls, Rensselaer County, DEC Site No.: 442048. C.T. Male Associates. May 23, 2019.
- C.T. Male Associates, 2019d. Final Regional Air Deposition Study Work Plan for the Village of Hoosick Falls. C.T. Male Associates, August 23, 2019.
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- C.T. Male Associates and BEC, 2021a. Supplemental Scope of Work, Regional Air Deposition Study. Village of Hoosick Falls, Rensselaer County. C.T. Male Associates and BEC Engineering and Geology, P.C., July 15, 2021.
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NYSDEC, 2019. Sampling for 1,4-Dioxane and Per- and Polyfluoroalkyl Substances (PFAS) Under DEC's Part 375 Remedial Programs. February 2019.

Tables

Table 2A
Water Parameters and Limits
Saint-Gobain Performance Plastics
Hoosick Falls, NY QAPP Revision 2

Parameter	Method	MDL	LOQ	Unit	MS/MSD Limits	LCS/LCSD Limits	RPD
Per- and Polyfluoroalkyl Substances (PFAS)							
Perfluorobutanoic acid (PFBA)	EPA 1633A	1.1	4.0	ng/L	70-140	70-140	30
Perfluoropentanoic acid (PFPeA)	EPA 1633A	0.6	2.0	ng/L	65-135	65-135	30
Perfluorohexanoic acid (PFHxA)	EPA 1633A	0.5	2.0	ng/L	70-145	70-145	30
Perfluoroheptanoic acid (PFHpA)	EPA 1633A	0.8	2.0	ng/L	70-150	70-150	30
Perfluorooctanoic acid (PFOA)	EPA 1633A	0.9	2.0	ng/L	70-150	70-150	30
Perfluorononanoic acid (PFNA)	EPA 1633A	0.5	2.0	ng/L	70-150	70-150	30
Perfluorodecanoic acid (PFDA)	EPA 1633A	0.5	2.0	ng/L	70-140	70-140	30
Perfluoroundecanoic acid (PFUnA)	EPA 1633A	0.5	2.0	ng/L	70-145	70-145	30
Perfluorododecanoic acid (PFDoA)	EPA 1633A	0.5	2.0	ng/L	70-140	70-140	30
Perfluorotridecanoic acid (PFTrDA)	EPA 1633A	0.5	2.0	ng/L	65-140	65-140	30
Perfluorotetradecanoic acid (PFTeDA)	EPA 1633A	0.5	2.0	ng/L	60-140	60-140	30
Perfluorobutanesulfonic acid (PFBS)	EPA 1633A	0.5	2.0	ng/L	60-145	60-145	30
Perfluoropentanesulfonic acid (PFPeS)	EPA 1633A	0.5	2.0	ng/L	65-140	65-140	30
Perfluorohexanesulfonic acid (PFHxS)	EPA 1633A	0.8	2.0	ng/L	65-145	65-145	30
Perfluoroheptanesulfonic acid (PFHpS)	EPA 1633A	0.5	2.0	ng/L	70-150	70-150	30
Perfluorooctanesulfonic acid (PFOS)	EPA 1633A	1.3	2.0	ng/L	55-150	55-150	30
Perfluorononanesulfonic acid (PFNS)	EPA 1633A	0.5	2.0	ng/L	65-145	65-145	30
Perfluorododecanesulfonic acid (PFDoS)	EPA 1633A	0.6	2.0	ng/L	50-145	50-145	30
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	EPA 1633A	1.0	4.0	ng/L	70-145	70-145	30
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	EPA 1633A	1.0	4.0	ng/L	65-155	65-155	30
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	EPA 1633A	1.0	4.0	ng/L	60-150	60-150	30
Perfluorooctanesulfonamide (PFOSA)	EPA 1633A	0.5	2.0	ng/L	70-145	70-145	30
N-methylperfluorooctane sulfonamide (NMeFOSA)	EPA 1633A	0.50	2.0	ng/L	60-150	60-150	30
N-ethylperfluorooctane sulfonamide (NEtFOSA)	EPA 1633A	1.10	2.0	ng/L	65-145	65-145	30
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	EPA 1633A	0.50	2.0	ng/L	50-140	50-140	30
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	EPA 1633A	0.5	2.0	ng/L	70-145	70-145	30
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	EPA 1633A	4.00	10.0	ng/L	70-145	70-145	30
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	EPA 1633A	4.00	10.0	ng/L	70-135	70-135	30
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	EPA 1633A	1.40	2.0	ng/L	70-140	70-140	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	EPA 1633A	0.50	2.0	ng/L	65-145	65-145	30
Perfluoro-4-methoxybutanoic acid (PFMBA)	EPA 1633A	0.50	2.0	ng/L	60-150	60-150	30
Perfluoro-3-methoxypropanoic acid (PFMPA)	EPA 1633A	0.50	2.0	ng/L	55-140	55-140	30
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	EPA 1633A	0.50	2.0	ng/L	50-150	50-150	30
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CI-PF3ONS)	EPA 1633A	0.50	2.0	ng/L	70-155	70-155	30
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CI-PF3OUdS)	EPA 1633A	0.50	2.0	ng/L	55-160	55-160	30
Perfluoro (2-ethoxyethane) sulfonic acid (PFEEESA)	EPA 1633A	0.50	2.0	ng/L	70-140	70-140	30
3-Perfluoropropylpropanoic acid (3:3 FTCA)	EPA 1633A	1.00	4.0	ng/L	65-130	65-130	30
3-Perfluoropentylpropanoic acid (5:3 FTCA)	EPA 1633A	2.80	10.0	ng/L	73-135	73-135	30
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	EPA 1633A	2.50	10.0	ng/L	50-145	50-145	30
Perfluorodecanesulfonic acid (PFDS)	EPA 1633A	0.50	2.0	ng/L	60-145	60-145	30

Table 2A
Water Parameters and Limits
Saint-Gobain Performance Plastics
Hoosick Falls, NY QAPP Revision 2

Parameter	Method	MDL	LOQ	Unit	MS/MSD Limits	LCS/LCSD Limits	RPD
MDL - Method Detection Limit					MDL, LOQ/RL, and QC limits are evaluated periodically and are subject to change.		
LOQ - Limit of Quantitation					MDL and LOQ/RL may vary based on initial volume, dilution factor, and possible matrix interferences.		
MS - Matrix Spike							
MSD - Matrix Spike Duplicate							
LCS - Laboratory Control Sample							
LCSD - Laboratory Control Sample Duplicate							
RPD - Relative Percent Difference (if #/# - first # = spike criteria, second # = sample criteria)							

Table 2B
Solid Parameters and Limits
Saint-Gobain Performance Plastics
Hoosick Falls, NY QAPP Revision 2

Parameter	Method	MDL	LOQ	Units	MS/MSD Limits	LCS/LCSD Limits	RPD
Per- and Polyfluoroalkyl Substances (PFAS)							
Perfluorobutanoic acid (PFBA)	EPA 1633A	0.10	0.4	ng/g	70-140	70-140	30
Perfluoropentanoic acid (PFPeA)	EPA 1633A	0.10	0.2	ng/g	60-150	60-150	30
Perfluorohexanoic acid (PFHxA)	EPA 1633A	0.10	0.2	ng/g	65-140	65-140	30
Perfluoroheptanoic acid (PFHpA)	EPA 1633A	0.10	0.2	ng/g	65-145	65-145	30
Perfluorooctanoic acid (PFOA)	EPA 1633A	0.06	0.2	ng/g	70-150	70-150	30
Perfluorononanoic acid (PFNA)	EPA 1633A	0.10	0.2	ng/g	70-155	70-155	30
Perfluorodecanoic acid (PFDA)	EPA 1633A	0.06	0.2	ng/g	70-155	70-155	30
Perfluoroundecanoic acid (PFUnA)	EPA 1633A	0.10	0.2	ng/g	70-155	70-155	30
Perfluorododecanoic acid (PFDoA)	EPA 1633A	0.10	0.2	ng/g	70-150	70-150	30
Perfluorotridecanoic acid (PFTrDA)	EPA 1633A	0.10	0.2	ng/g	65-150	65-150	30
Perfluorotetradecanoic acid (PFTeDA)	EPA 1633A	0.10	0.2	ng/g	65-150	65-150	30
Perfluorobutanesulfonic acid (PFBS)	EPA 1633A	0.10	0.2	ng/g	65-145	65-145	30
Perfluoropentanesulfonic acid (PFPeS)	EPA 1633A	0.10	0.2	ng/g	55-160	55-160	30
Perfluorohexanesulfonic acid (PFHxS)	EPA 1633A	0.10	0.2	ng/g	60-150	60-150	30
Perfluoroheptanesulfonic acid (PFHpS)	EPA 1633A	0.10	0.2	ng/g	65-155	65-155	30
Perfluorooctanesulfonic acid (PFOS)	EPA 1633A	0.10	0.2	ng/g	65-160	65-160	30
Perfluorononanesulfonic acid (PFNS)	EPA 1633A	0.10	0.2	ng/g	55-140	55-140	30
Perfluorodecanesulfonic acid (PFDS)	EPA 1633A	0.10	0.2	ng/g	40-155	40-155	30
Perfluorododecanesulfonic acid (PFDoS)	EPA 1633A	0.10	0.2	ng/g	25-160	25-160	30
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	EPA 1633A	0.20	0.4	ng/g	60-150	60-150	30
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	EPA 1633A	0.20	0.4	ng/g	55-200	55-200	30
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	EPA 1633A	0.20	0.4	ng/g	70-150	70-150	30
Perfluorooctanesulfonamide (PFOSA)	EPA 1633A	0.10	0.2	ng/g	70-140	70-140	30
N-methylperfluorooctane sulfonamide (NMeFOSA)	EPA 1633A	0.10	0.2	ng/g	70-155	70-155	30
N-ethylperfluorooctane sulfonamide (NEtFOSA)	EPA 1633A	0.10	0.2	ng/g	70-140	70-140	30
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	EPA 1633A	0.10	0.2	ng/g	65-155	65-155	30
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	EPA 1633A	0.10	0.20	ng/g	65-165	65-165	30
N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	EPA 1633A	0.50	1.00	ng/g	70-140	70-140	30
N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	EPA 1633A	0.50	1.00	ng/g	70-135	70-135	30
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	EPA 1633A	0.10	0.20	ng/g	70-145	70-145	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	EPA 1633A	0.10	0.20	ng/g	70-160	70-160	30
Perfluoro-3-methoxypropanoic acid (PFMPA)	EPA 1633A	0.10	0.20	ng/g	30-140	30-140	30
Perfluoro-4-methoxybutanoic acid (PFMBA)	EPA 1633A	0.10	0.20	ng/g	60-150	60-150	30
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	EPA 1633A	0.10	0.20	ng/g	60-155	60-155	30
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	EPA 1633A	0.10	0.20	ng/g	70-150	70-150	30
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	EPA 1633A	0.10	0.20	ng/g	4-160	4-160	30
Perfluoro (2-ethoxyethane) sulfonic acid (PFEEESA)	EPA 1633A	0.10	0.20	ng/g	70-140	70-140	30
3-Perfluoropropylpropanoic acid (3:3 FTCA)	EPA 1633A	0.20	0.40	ng/g	45-130	45-130	30
3-Perfluoropentylpropanoic acid (5:3 FTCA)	EPA 1633A	0.50	1.00	ng/g	60-130	60-130	30
3-Perfluoroheptylpropanoic acid (7:3 FTCA)	EPA 1633A	0.50	1.00	ng/g	60-150	60-150	30

Table 2B
Solid Parameters and Limits
Saint-Gobain Performance Plastics
Hoosick Falls, NY QAPP Revision 2

Parameter	Method	MDL	LOQ	Units	MS/MSD Limits	LCS/LCSD Limits	RPD
MDL - Method Detection Limit	MDL, LOQ/RL, and QC limits are evaluated periodically and are subject to change.						
LOQ - Limit of Quantitation	MDL and LOQ/RL may vary based on initial mass, dilution factor, % solids, and possible matrix interferences. Results will be reported on a dry weight basis.						
MS - Matrix Spike							
MSD - Matrix Spike Duplicate							
LCS - Laboratory Control Sample							
LCSD - Laboratory Control Sample Duplicate							
RPD - Relative Percent Difference (if #/# - first # = spike criteria, second # = sample criteria)							

Attachment A

Personnel Resumés



DANIEL REILLY, P.E.

Chief Executive Officer/President

SUMMARY

Mr. Reilly joined C.T. Male in 1993 and serves as the firm's Chief Executive Officer (CEO) and President. In those capacities, he is responsible for all operational and business aspects of the firm and shares strategic planning responsibilities with the firm's Board Chair. He was formally the Chief Operating Officer and Environmental Services Division Manager.

Mr. Reilly holds a B.S. degree in Environmental Engineering from Rensselaer Polytechnic Institute and is a licensed Professional Engineer in NY. He is a shareholder of the firm and is a member of the Board of Directors. He is also a member of the Eastern New York Chapter of the Air & Waste Management Association. Prior to his management responsibilities, Mr. Reilly specialized in industrial environmental regulatory compliance and PFAS related services.

PROFESSIONAL BACKGROUND

Licensed Professional Engineer in NY

YEARS OF EXPERIENCE

Total Years of Experience: 33

Total Years with C.T. Male: 33

EDUCATION

BS in Environmental Engineering
Rensselaer Polytechnic Institute

SPECIALIZED TRAINING

OSHA 40-Hour Health & Safety Training

NOTABLE PROJECT EXPERIENCE

Emerging Contaminants

- PFAS Remedial Investigation activities for an industrial client conducted on a regional basis in NY, VT & NH

Petroleum & Chemical Bulk Storage

- Eastern Correction Facility
- Albany County Airport Authority

Environmental Auditing

- Multiple Colleges, Hospitals & Industrial Facilities

Air Permitting

- GLOBALFOUNDRIES, Fab 8, Malta, NY
- AMRI Large Scale Manufacturing Facility, Rensselaer, NY
- Saint Gobain Performance Plastics Corporation

Water & Wastewater

- Water System Improvements, Town of Bethlehem, NY
- Bedford Hills Correctional Facility Water System Improvements, Westchester County, NY
- I684 Rest Area WWTP, Putnam County, NY



C.T. Male Associates

A DESIGN PROFESSIONAL CORPORATION



JONATHAN DIPPERT, P.G.

Project & Division Manager

SUMMARY

Mr. Dippert joined C.T. Male in 2007 with extensive experience as an environmental consultant, project manager and Professional Geologist. His experience include soil and groundwater investigations with an emphasis in emerging contaminants, Phase II Environmental Site Assessments, remedial action field oversight, hydrogeologic investigations involving public and private water supply, and participation in various other environmental projects.

The projects have included oversight of contractors, characterization of environmental media (e.g., soil) to support decision process, coordination with regulatory agencies to develop and implement work plans and reporting, and evaluation of the data to prepare remedial alternatives analysis.

Mr. Dippert is responsible for the preparation of technical reports, data research, staying current and training staff on new field technologies and methods, and management of staff capabilities, depth of services, coordinating/reviewing the quality of work for project team staff including relevant field logs and mapping, and adherence to applicable standard operating procedures, scopes of work, and state and federal regulations and guidelines.

PROFESSIONAL BACKGROUND

Licensed Professional Geologist in NY

YEARS OF EXPERIENCE

Total Years of Experience: 21
Total Years with C.T. Male: 19

EDUCATION

BA in Geology and Geophysics
University of Connecticut

PROFESSIONAL AFFILIATIONS

Hudson Mohawk Professional Geologist
Association (HMPGA)
Programming Chair, 2022-present

HMPGA
Board Member, 2023-present

SPECIALIZED TRAINING

OSHA 1910.120 HAZWOPER and Annual 8 Hour
Certification

OSHA Confined Space Entry Training

OSHA Lockout/Tagout - Control of Hazardous
Energy Training

Aquifer Testing for Improved Hydrogeologic Site
Characterization Featuring AQTESOLV and In-Situ
LevelTROLL, Colorado School of Mines

Certified Hazardous Materials Manager
Review, University of Iowa

Midwest Geosciences Group Webinar Series,
Aquifer Evaluation and various short courses

NOTABLE PROJECT EXPERIENCE

Emerging Contaminant (EC) Projects

- 2 Sites, Hoosick Falls, New York
- 1 Site, North Bennington, Vermont
- 1 Site, Merrimack, New Hampshire
- 1 Site, Saranac Lake, New York

NYSDEC ERP & BCP Projects

- 312 Broadway ERP, Schenectady, New York
- 400 Broadway ERP, Saranac Lake, New York
- Public School 6, Yonkers, New York
- 188 Warburton Avenue, Yonkers, New York
- Former Miron Pre-Cast, Kingston, New York
- 354 Broadway, Fort Edward, New York

Water Supply Projects

- Hydrogeologic Evaluation, Saratoga Springs, NY
- Residential drinking water well replacement,
North Bennington, VT

Facility Support/Environmental Services

- Remedial Spill Monitoring, Glens Falls, NY
- Confidential Client, Hoosick Falls, NY
- Long-Term Monitoring, Bennington, VT



C.T. Male Associates

A DESIGN PROFESSIONAL CORPORATION



NANCY GARRY, P.E., CSP

Senior Environmental Engineer

SUMMARY

Ms. Garry joined C.T. Male in 2017 as a Senior Environmental Engineer. She has extensive experience in site investigation and remediation projects and environmental compliance. Ms. Garry also has extensive experience in OSHA and environmental, health and safety on-site compliance for industrial and government clients. Ms. Garry serves as the firm's Corporate Safety Manager.

Ms. Garry is responsible for projects including Clean Air Act assessments and compliance; Risk Management Plans; chemical and petroleum bulk storage assessments and compliance; environmental audits; Phase 1 & 2 environmental site assessments; and various environmental engineering projects.

PROFESSIONAL BACKGROUND

Licensed Professional Engineer in NY

Certified Safety Professional

YEARS OF EXPERIENCE

Total Years of Experience: 29

Total Years with C.T. Male: 9

EDUCATION

Master in Environmental Engineering
Rensselaer Polytechnic Institute

BA in Chemistry/Biology
College of St. Rose

PROFESSIONAL AFFILIATIONS

NYS Society of Professional Engineers

Capital District Chapter, NYS Society of Professional Engineers
Director 2017-2019 and MATHCOUNTS volunteer scorer (2019 - Present)

American Society of Safety Professionals
Member

SPECIALIZED TRAINING

OSHA 40 Hr HAZWOPER

OSHA 8 Hr HAZWOPER Supervisor

OSHA 10 Hr Construction

RCRA Hazardous Waste Mgt.

DOT Ground Shipper

NOTABLE PROJECT EXPERIENCE

College and School Experience

Managed a three year (2015 -2018), New York State Office of General Services, Environmental Remediation Services Statewide Term Contract*. Projects under these contracts have included:

- Tank design packages for the removal of underground and above-ground storage tanks and installation of aboveground storage tanks for back up fuel sources and fueling stations at numerous Department of Corrections and Community Supervision facilities throughout NYS.
- Three New York State Department of Transportation former spills sites that required remediation, ongoing monitoring, and spill closure.

Managed a seven year (2008 -2015), New York State Department of Environmental Conservation, Standby Engineering Services for Remediation Statewide, Term Contract*. Projects under these contracts have included:

- Managed approx. twenty-five projects under the NYSDEC contract that included site characterizations, remedial investigations, feasibility studies, point of entry use systems, and site management throughout NYS. Management included submitting work plans, reports, health & safety plans, quality control plans, and review of subcontractors plans. (*Projects completed at previous employer).

Long term ongoing ground water remedial treatment system operation, that includes remote access and control, monthly sampling and weekly inspections. The remedial treatment system is part of an Interim Remedial Measure (IRM) for the project site per NYSDEC.

Preparing Site Safety Plans across company Divisions: Environmental, Civil, Mechanical/Electrical, Survey; for submission to various private, municipal and agency clients. This includes reviewing clients needs for the project, review scope of work with project teams for understanding of potential hazards for project work, and addressing comments from clients of the Site Safety Plans.



C.T. Male Associates

A DESIGN PROFESSIONAL CORPORATION



CLIFF BONDI

Geologist III

SUMMARY

Mr. Bondi has over 9 years of environmental consulting experience as a geologist with a large majority of his time spent on PFAS-related sites. His experience ranges from remedial investigations (RI), site investigations (SI), report writing, data management including EQulS, geographic information systems (GIS) mapping, as well as communicating with contractors, clients, and NYSDEC. Subject sites he has worked extensively on include airports, secondary PFAS production sites, State Superfund sites, Brownfield Cleanup Program (BCP) sites, industrial sites, municipal water supply sites, and environmental site assessments. Mr. Bondi has conducted extensive field investigation activities including but not limited to surface, near surface, and subsurface soil, groundwater, surface water, and vapor sampling at numerous sites across New York, Vermont, and Pennsylvania focused primarily on emerging contaminants such as PFAS. Mr. Bondi is one of the firm's leading experts in PFAS related investigations, PFAS sampling methods and protocols, field activities, site characterization, and remediation measures, and also manages field staff and teams throughout various stages of field investigations and sampling activities.

Mr. Bondi's technical expertise is in field sampling techniques and procedures for PFAS and various other environmental contaminants, along with managing field teams for efficient and accurate data collection, geologic mapping, and data management and analysis. His position duties include data collection quality control, data management, map and figure generation for field use and reporting, scheduling staff and contractors, and assisting project managers with various tasks and general management. His extensive experience in a wide variety of PFAS related projects facilitates his high-quality technical support for both field teams and project managers in all stages of work.

YEARS OF EXPERIENCE

Total Years of Experience: 10

Total Years with C.T. Male: 9

EDUCATION

BS in Geology

State University of New York at Potsdam

SPECIALIZED TRAINING

OSHA 1910.120 HAZWOPER and Annual 8-Hour Certification

Lock-Out-Tag-Out Certification

First Aid and CPR Certification

PROFESSIONAL AFFILIATIONS

Hudson-Mohawk Professional Geologist Association Member

NOTABLE PROJECT EXPERIENCE

- First Prize Center Site - Remedial Investigation (RI), IDW Treatment and Disposal, Environmental Remediation, GIS, Data Management, Reporting, Albany, NY
- Confidential Site - Remedial Investigation (RI), Environmental Remediation, GIS, Data Management, Yonkers, NY
- Hudson Valley Regional Airport - Remedial Investigation (RI), GIS, Data Management, Dutchess County, NY
- Confidential Site - Remedial Investigation (RI), GIS, Data Management, Troy, NY
- Confidential Site - Remedial Investigation (RI), GIS, Data Management, Guilderland, NY



C.T. Male Associates

A DESIGN PROFESSIONAL CORPORATION



PROFESSIONAL BACKGROUND

Licensed Professional Engineer in NY

NYSDOL Licensed Asbestos Project Designer

YEARS OF EXPERIENCE

Total Years of Experience: 31

Total Years with C.T. Male: 29

EDUCATION

BS in Civil Engineering

Rochester Institute of Technology

PROFESSIONAL AFFILIATIONS

American Society of Civil Engineers, Hudson Mohawk Section, Member

The Practicing Institute of Engineering, Inc., Member and Continuing Education Course Evaluator

The Foundation for Engineering Education, Inc., E-Week Steering Committee Co-Chair

Greenbush Branch YMCA Volunteer and Advisory Council Member

Capital District YMCA Facilities Committee Member

SPECIALIZED TRAINING

OSHA 40-Hour Health & Safety Training

OSHA 10-Hour Construction Safety

Hazmat Ground Shipper Certification - 2023

JEFFREY A. MARX, P.E.

Managing Environmental Engineer/Principal

SUMMARY

Mr. Marx joined C.T. Male in 1997 as an Environmental Engineer and is currently a Managing Environmental Engineer responsible for supervising five engineers and one geologist within the Environmental Division mainly related to environmental compliance, due diligence property assessments and investigation/remediation of all types of facilities. His responsibilities include development and implementation of environmental investigations for NYS Brownfield, Environmental Restoration and Spills Program sites; tank assessment/closures; PFAS sampling and cleanup; managing post-closure landfill monitoring; hazardous waste sampling, management and disposal; due diligence environmental assessments and scoping; remediation scoping and implementation; and QA/QC and lab data management of environmental projects following NYSDEC EQuIS submission requirements. Mr. Marx understands fate and transport of environmental contaminants in various media; authors technical specifications and reports; manages multi-discipline projects and remedial construction activities; and leads environmental compliance assistance (i.e., petroleum and chemical bulk storage, industrial wastewater management, hazardous waste, PBS related SPCC Plans, CBS related SPRs, air permitting, industrial SWPPPs, etc.) for industrial clients.

NOTABLE PROJECT EXPERIENCE

NYSDOC ERP & BCP (Certifying Remedial Engineer)

- Hamilton Hill II BCP; Schenectady, NY
- Former Grand Union BCP; Fort Edward, NY
- Former Chalmers Knitting Mill ERP; Amsterdam, NY
- Former Tanneries (3 sites) ERPs; Gloversville, NY
- South Troy Industrial Park ERP; Troy, NY

Phase II ESAs, Tank Closures & Remediation

- Tobin Investments, Tank Closure; Champlain, NY
- Haleon (formerly GSK), Tank Closure and Spill Cleanup
- Confidential Site, Buried Drums Assessment & Removal; Malta, NY
- Bobby's Auto Decommissioning; Schenectady, NY

Environmental Compliance

- Regeneron Pharmaceuticals, Rensselaer & East Greenbush NY Facilities, Various Regulatory Programs
- Haleon (formerly GSK), Durham, NY, SPCC Plan, SWPP Plan, BMP Plan, Hazardous Waste Reporting, Mercury Minimization Plan
- GlobalFoundries; Malta, NY, Various Regulatory Programs

Emergency Contaminant Work

- Fenix Parts, Inc., Queensbury, NY, PFAS Spill Cleanup
- Schuyler Heights Fire District, Menands, NY, PFAS Site Monitoring
- Saint-Gobain, Multiple Facilities, PFAS Lab Data Management

Water Withdrawal Permitting

- Rocking Horse Ranch; Highland, NY
- Indeck Corinth Energy Center; Corinth, NY



C.T. Male Associates

A DESIGN PROFESSIONAL CORPORATION

BRIAN ANGERMAN, PE
Senior Environmental Engineer



Experience

Brian has more than 27 years of experience and a master's degree in environmental engineering. His work has involved designing soil- and water-treatment systems and operating remediation systems. Examples of Brian's experience include:

- Serving as project principal for investigation of multiple sites with per- and polyfluoroalkyl substances (PFAS) impacts. Led a team of geologists, hydrogeologists, and groundwater modelers in characterizing the extent, transport, and ultimate remediation of PFAS impacts.
- Serving a project principal for an industrial wastewater bench and pilot study for the removal of PFAS compounds. Led a team of engineers and scientists to develop a phased approach for treatment of a difficult chemical matrix and to ultimately allow for PFAS removal.
- Managing the design of a new groundwater recovery and treatment system for containment and treatment of a sulfolane plume. The system included recovery wells, aeration pond, greensand filter, and granular activated carbon (GAC) vessels. Responsibilities also included operation and monitoring support and regulatory reporting.
- Serving as principal in charge for design and construction management of an air-sparging system to mitigate dissolved phase contaminations at a major Midwestern refining facility.
- Managing the design of modification to an existing groundwater treatment system to remove sulfolane. The design included addition of a sand filter to remove solids and GAC system to remove sulfolane. Responsibilities also included operation and monitoring support and regulatory reporting.
- Managing the design of a full-scale air-sparge pilot-test system to calculate degradation of recalcitrant contaminants.
- Serving as project manager for design of a groundwater treatment system using GAC to remove sulfolane.
- Managing the pilot testing and design of a point-of-entry treatment system using GAC to remove sulfolane.
- Designing and overseeing the contracts for and implementation of soil-and groundwater-remediation systems at a former petroleum-storage and-transport facility. The remediation system included dual-phase recovery; soil-vapor extraction with off-gas treatment; air sparging of groundwater; and water treatment by means of an air stripper. Currently serving as project manager of system operations and maintenance, as well as enhancement of the system, including an air-sparging system.
- Serving as project manager for emergency-response assistance to a large-scale crude-oil pipeline release. Work includes oversight of field activities, groundwater-monitoring program, and remediation-system design.

- Serving as project manager for evaluation of a groundwater-interceptor system at a Midwestern chemical facility. Work included evaluation of system performance through groundwater monitoring and data evaluation.
- Serving as project manager for evaluation and design optimization of an existing groundwater-remediation system at a crude-oil-refining facility.
- Serving as project manager for regulatory closure of a former tank-farm area contaminated with lead-impacted soil. The lead-impacted material was solidified with Portland cement.
- Serving as project manager for investigation and remediation of a soil and groundwater TCE (trichloroethylene) plume. Remediation included soil and groundwater removal, and overall responsibilities included regulatory negotiations.
- Serving as project manager and principal in charge for remediation-systems operation at a major Midwestern refinery. Remediation systems include three soil-vapor extraction systems, two air-sparge systems, and a groundwater-interceptor trench.
- Serving as project manager for the design, installation, and operation of a dual-phase groundwater and soil-vapor recovery system at a major Midwestern refinery.
- Serving as field engineer for stormwater-basin construction, including sewer piping, liner installation, and a contaminant cap.
- Working with a refining company to determine whether the drinking-water system at a Minnesota facility was in compliance with the Safe Drinking Water Act. Presented findings of the study in a report. Also prepared a study that reviewed flows to the client's stormwater ponds.
- Performing and managing a NESHAP sample program for a major Midwestern refinery. Responsibilities included inspecting process piping to determine sample locations.
- Serving as principal in charge for multiple geotechnical investigations at a major Midwestern refining facility.
- Serving as project manager for design and construction oversight for upgrades to a French drain-type collection system at a major Midwestern refinery. Work included installation of a sheet pile wall, a new piping system, and electrical system upgrades.
- Developing plans and specifications for the Suburban Hennepin Regional Park District for redesigning the filtration system for a sand-bottom swimming pond at the Lake Minnetonka Regional Park.
- Serving as a project engineer for a downstream-users study for Devils Lake, North Dakota, for the St. Paul District Corps of Engineers. The study determined the effects on industries and water treatment plants of pumping floodwaters from Devils Lake (whose water contains high levels of dissolved solids) into the Sheyenne River, which ultimately flows into the Red River of the North. Interviewed operators of the water treatment plants to determine the effects that water from Devils Lake would have on their treatment systems; also interviewed representatives from industries drawing

water from the Sheyenne River and Red River to determine the effects that changed water quality would have on their processes.

During graduate school, Brian worked as both a research and teaching assistant. His responsibilities included investigating the formation of disinfection by-products, as well as examining chlorine decay in water-distribution systems.

Brian completed three internships in the environmental department of a Midwestern refinery. His work involved arranging for laboratories to analyze waste in order to determine its characteristics; managing the hazardous-waste pad; and coordinating the proper disposal of refinery wastes. In addition, he monitored the performance of the wastewater treatment facility to help ensure compliance with the refinery's NPDES permits.

- Education** MS, Environmental Engineering, University of Iowa, 1998
BS, Environmental Engineering, Michigan Technological University, 1996
- Registration** Professional Engineer: New York, Iowa, Michigan, Minnesota, and New Hampshire
- Publications** Valentine, R.L., P.J. Vikesland, B.D. Angerman, S.A. Hackett, M. Shoup, and S. Slattenow. 2000. *The Role of the Pipe-Water Interface in the Formation of Disinfection By-Products and the Loss of Disinfectants in Drinking Water*. AWWARF Press: Denver, CO.
Valentine, R.L., B. Angerman, S. Hackett, P. Vikesland, and S. Slattenow. 1999. Characterization of disinfectant decay and DBP formation in the presence of water distribution system deposits. *Proceedings of the AWWA Water Technology Conference*.

SARA RAMSDEN, PE
Senior Environmental Engineer



Experience

Sara Ramsden has more than 20 years of experience in environmental engineering and a master's degree in environmental engineering from the University of Minnesota. Sara's experience includes managing contaminated site investigation and remediation projects, including work in site investigations, remedial action coordination, remedial design and operation, and brownfields redevelopment. She specializes in addressing legacy environmental issues at high-profile contaminated sites with multiple stakeholders. Relevant examples of her experience include:

- Serving as project manager and directing work on a wide-ranging, multi-media remedial investigation, feasibility study, and interim response action involving the presence of per- and polyfluoroalkyl substances (PFAS), a sub-set of perfluorinated chemicals (PFCs), at a project in the eastern United States. PFAS has been detected in the public water supply and private wells in the project area. The project involves a complex group of potentially responsible parties working with local, state, and federal regulatory authorities to address PFAS issues across multiple sites located in the same municipality. Extensive soil and groundwater investigations are ongoing in support of federal and state remedial investigation and feasibility study (RI/FS) processes, and interim remedial actions, including groundwater extraction and treatment, are being considered concurrently with the investigation work. Sara and her team conducted PFAS-water-treatment pilot-testing at the site and have evaluated water treatment options, including granular activated carbon and ion exchange. BEC serves as the lead consultant for developing and refining a complex site conceptual model through iterative efforts, including complex groundwater flow modeling. The work has been closely coordinated between the potentially responsible parties and regulatory authorities as they work to address a significant public interest in the project.
- Directing the sampling of more than 300 private wells and 15 public water systems for PFAS analysis near a manufacturing facility since 2022 as project principal. Helped with development of a project approach that allowed us to quickly identify private wells and public systems using public databases. Property owners were contacted to gain access and schedule sampling activities and a project-specific hotline and email address were established for questions. The team uses Microsoft PowerApp to enter and store communications, sampling data, and overarching parcel information and uses Microsoft PowerBI to visually display the results in real-time for our client and project staff. These real-time displays helped to quickly provide sampling results and allowed the client to track project progress and communicate with regulatory agencies.
- Serving as project manager on a fast-track, complex vapor intrusion investigation and mitigation project in Minnesota for a confidential client since 2010. Assisted with MPCA Superfund staff negotiations to shut down a remedial groundwater pump-out system that had operated for 25 years at the site. Since 2013, the project involved the collection of samples to analyze for the presence of trichloroethene (TCE) including soil gas and groundwater samples from public rights-of-way using direct-push technology, sub-slab soil gas samples from beneath over 300 homes and buildings, and collection of indoor and outdoor air samples from certain buildings. Vapor mitigation systems have been installed in approximately 180 buildings. As part of the

sub-slab sampling effort, Sara and her team communicated with property owners and building occupants regarding sampling in the homes or buildings, obtained access agreements, and scheduled sampling appointments. Responsibilities included overall project management, including coordination of up to 50 team members, communications with the client, regulatory agencies, and other project stakeholders, and response action implementation reporting.

- Managing the project team that assists the city of New Brighton with one of the largest and most complex brownfield redevelopments in Minnesota. The redevelopment involves 15 properties in the 90-acre northwest-quadrant area adjoining I-694 and I-35W. The properties include nine petroleum-release sites, a former refinery and Superfund site, two former municipal dumps with landfill gas concerns, and other concerns related to past solvent and chemical use. Responsibilities included assisting with Phase I site assessments and Phase II investigations, preparing response action plans, coordinating response action field work and monitoring programs, preparing response action implementation reports, and communication with the Minnesota Pollution Control Agency (MPCA) Voluntary Investigation and Cleanup Program (VIC) and the Petroleum Brownfields program.
- Managing the project team that assisted the city of Minneapolis with a groundwater monitoring program during a construction dewatering project on city property that is adjacent to several Superfund sites with chlorinated volatile organic compound (VOC) groundwater impacts. Work included preparation of a groundwater monitoring work plan, coordination of weekly sampling events, and communications with MPCA and Minnesota Department of Health staff.
- Serving as project manager since 2010 and project principal since 2021 for a former wood-treating Superfund site with complex legacy issues in Fridley, Minnesota. Work includes coordinating groundwater monitoring, preparing biennial monitoring reports, and negotiating and communicating with MPCA Superfund staff. Coordinated several redevelopment projects at the site with current property owners and with Metropolitan Council Environmental Services (MCES) and their environmental consultant regarding the rehabilitation of a sewer interceptor that runs through the site.
- Serving as project manager for assisting the city of Inver Grove Heights, Minnesota, with environmental concerns encountered during road construction. Work included review of Phase I site assessments, coordination of Phase II investigations and construction observation, and response action plan preparation. Coordinated with MnDOT, MPCA, and civil engineering consultant.

Education	MS, Environmental Engineering, University of Minnesota, 2006 BChE, Chemical Engineering (emphasis: environmental engineering), University of Minnesota, 2002
Registration	Professional Engineer: New York, Illinois, Michigan, Minnesota, and Washington

**Publications/
Presentations**

"Groundwater evaluation to vapor intrusion and back again: a large-scale vapor intrusion case study." 2022. Oral Presentation at the Groundwater Professionals of North Carolina's Fall Mini-Conference: Raleigh, NC. October 2022.

"The integrated toolbox needed to respond to PFAS investigation requests." 2022. Panel participant at Air & Waste Management Association's Annual Conference. San Francisco, CA. June 2022.

Ramsden, S., Gaffin, S., Blodgett, E., Sands, M. 2022. "Stakeholder engagement with a personal approach: a large-scale vapor intrusion assessment success story." Platform (oral) presentation at Battelle's Twelfth International Conference on Remediation of Chlorinated and Recalcitrant Compounds: Palm Springs, CA. May 2022.

Ramsden, S., Andrews, L., Macejkovic, J. 2019. "Unique management challenges for emerging contaminants on high-profile sites." Oral presentation at Michigan Environment, Great Lakes, and Energy's Great Lakes Remediation and Redevelopment Conference: Lansing, MI. October 2019.

Sullivan, J.M., Metzger, M., Segroves, L., Ramsden, S. "Life-Cycle Assessment (LCA) for Green and Sustainable Remediation" Poster presentation at Battelle's Third International Symposium on Bioremediation and Sustainable Environmental Technologies: Miami, Florida. May 2015.

"Mitigation Techniques – Classic and New Technologies." Oral presentation at the Minnesota Brownfields Vapor Intrusion Forum: St. Paul, Minnesota. January 2015.

Ramsden, S.J., S. Ghosh, L.J. Bohl, T.M. LaPara. 2010. "Phenotypic and genotypic analysis of bacteria isolated from three municipal wastewater treatment plants on tetracycline-amended and ciprofloxacin-amended growth media." *Journal of Applied Microbiology* 109:5, 1609-1618.

S. Ghosh, S. J. Ramsden, T.M. LaPara. 2009. "The role of anaerobic digestion in controlling the release of tetracycline resistance genes and class 1 integrons from municipal wastewater treatment plants." *Applied Microbiology and Biotechnology* 84:4, 791-796.

"Prevalence, Fate, and Characterization of Antibiotic-Resistant Bacteria in Municipal Wastewater Treatment Plants." Poster presentation at the 2006 ASM General Meeting: Orlando, Florida. May 2006.

"Prevalence, Fate, and Characterization of Antibiotic Resistant Bacteria in Wastewater Treatment Plants." Oral presentation at the ASM North Central Branch Annual Meeting. September 2005.

DANA BAKER PASI
Senior Environmental Scientist

BEC

- Experience** Dana has over 18 years of experience providing technical support for data quality assurance and related services. She is currently the coordinator of a team of data quality scientists. She often coordinates with field staff and laboratories to implement analysis for site-specific conditions. Prior to this, Dana had three years of experience as an environmental data management technician, which included assisting with data entry and verification of laboratory data into EQulS databases; producing database documentation; and preparing and sending out monitoring reports for several remediation sites. Examples of Dana's experience include:
- Confidential oil sands clients; fugitive-emissions monitoring campaigns; Alberta; data quality lead. Project included the implementation of 12 fugitive-emissions monitoring programs at two major oil-sands facilities in Alberta. Each program required collecting and processing emission data from approximately 250 sample locations. The target substances monitored and quantified included GHGs, volatile organic compounds (VOCs), reduced sulphur compounds (RSCs), polycyclic aromatic hydrocarbons (PAHs), ammonia, and sulphur dioxide. Dana has served as the data quality lead for these projects for more than seven years. She works closely with the project team providing coordination with the field staff and laboratory regarding sampling and analysis, respectively; providing data review and guidance on data usability; reviewing and approving laboratory subcontractor invoices; and preparing summary reports of the field and laboratory data review.
 - Confidential client; data review and validation projects; New York; project manager. Project manager on several projects involving data review and validation and preparation of data summary submittals per state specifications.
 - Confidential client; remedial investigation; Washington; data quality lead. Project included working with the Department of Ecology to prepare an approved QAPP; providing coordination with the field staff and laboratory regarding sampling and analysis, respectively; providing data review and guidance on data usability; reviewing and approving laboratory subcontractor invoices in excess of \$250,000 since 2019; and preparing summary reports of the field and laboratory data review.
 - Confidential state agency; quality management system audit and QAPP template development; Minnesota; project manager. Project included an audit of the existing state program's quality management system and development of a quality assurance project plan (QAPP) template. Our team provided recommendations with the long-term goal of a shared quality management system for all state remediation programs in order to promote consistency and improve overall data quality.
 - Confidential client; vapor intrusion investigation and mitigation project; Minnesota; quality assurance officer. Since 2013, this fast-tracked, complex project involved analyzing for the presence of trichloroethene (TCE) by collecting samples, including soil gas and groundwater samples from public rights-of-way using direct-push technology, sub-slab soil gas samples from beneath more than 300 homes and buildings, and outdoor air samples from certain buildings. Responsibilities entailed preparation of an MPCA-approved QAPP; data review and Level IV data validation on laboratory data; communication and technical assistance with the laboratory, field

staff, and other project stakeholders regarding sampling and analysis; and reviewing invoices and tracking analytical costs.

Additional and ongoing work

- Coordinating groundwater, surface water, soil, sediment, air, and pilot-testing sample events for a variety of environmental remediation and investigation sites, including railways, former manufactured-gas-plant sites, mining sites, landfill sites, pipelines, and voluntary investigation and cleanup sites in the United States and Canada. Responsibilities include acting as lab liaison, performing laboratory sampling audits, and examining analytical data to data-quality-control measures.
- Preparing quality assurance project plans (QAPPs) and sampling and analysis plans (SAPs) for federal, tribal, and state agency approval; evaluating analytical data under both contract laboratory program (CLP) and non-CLP data management guidelines; coordinating laboratory analysis and services and reviewing invoices; and preparing analytical data validation reports.
- Assisting with the data management team for internal database quality and training new staff on quality assurance/quality control (QA/QC) systems, including the EQulS Data Quality Module (DQM)
- Preparing analytical cost estimates and work orders.
- Providing guidance to clients regarding industrial stormwater compliance.
- Following method-specific quality assurance criteria.
- Following the USEPA's Contract Laboratory Program National Functional Guidelines for data validation.

Education BS, Biology, University of Minnesota, 2005

CURRICULUM VITAE



Bryan Eck, CEAC
Project Quality Assurance Chemist
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Mr. Eck performs analytical data validation and laboratory auditing to determine environmental data quality and usability for numerous project sites. Data reviewed include those for US EPA Contract Laboratory Program (CLP) protocols and SW-846 methods. In addition, he evaluates laboratory data deliverables to determine compliance with method, regulatory, and client-specific/Quality Assurance Project Plan (QAPP) requirements.

Mr. Eck has served as a project manager and laboratory coordinator for several projects. He has been responsible for tracking samples from collection through reporting; managing sample collection, receipt, analysis, and reporting issues; coordinating efforts and managing communications between multiple laboratories; reviewing Chain-of-Custody Records to ensure proper reporting; and creating and reviewing analytical service requests.

Education

MS | Chemistry | Villanova University | Villanova, PA | 2017

BS | Chemistry | Lycoming College | Williamsport, PA | 2015

Professional Affiliations, Licenses, and Certifications

Certified Environmental Analytical Chemist (CEAC)

National Registry of Certified Chemists (NRCC) | Washington, DC

Project Experience

Manufacturing Site Investigation | Michigan | Project Manager

Served as Project Manager for a Michigan site investigation and cleanup. The project scope included data validation, data management support, and chemistry quality assurance (QA) support. The analytical suite included both organic and inorganic parameters.

PFAS Investigations of Sites in Multiple States | Project Manager

Project Manager for several site investigations focused on per- and polyfluoroalkyl substances (PFAS) in various matrices. Locations included sites in New York, New Hampshire, Vermont, Michigan, New Jersey, West Virginia, and Ohio. Mr. Eck oversaw the data validation efforts, coordinated with the various lead and data management consultants, and provided chemistry consulting on an as-needed basis. Mr. Eck developed protocols to review the PFAS data from multiple laboratories, as many of the analyses were performed by laboratory-specific techniques. He assisted in the improvement of the laboratory techniques and troubleshooting for unexpected results and new matrices. These projects included aggressive schedules, training internal and external chemists to review the data, and working with the project laboratories to resolve various errors.

Emergency Response Project for a Railroad Company | Asst. Project Manager

Mr. Eck is the assistant project manager for an emergency response project for a railroad company. He coordinates delivery of data packages from several laboratories and for several matrices; coordinates the data validation efforts of several chemistry team members; tracks project schedules and deadlines; and communicates with the laboratories and client. In addition, he works with the data management department to maintain the project database.

For Planet & Progress.

BRYAN ECK, CEAC**Laboratory Program Coordination | Chemical Manufacturer | Laboratory Coordinator**

Mr. Eck was the main contact between several laboratories and a large chemical manufacturing company. He assisted in the coordination of the scheduling, sampling, and delivery of bottleware kits and samples from the field. He provided chemistry communication between the laboratory and client and served as the day-to-day contact for all issues and communication among the laboratories, the client, and our chemistry team.

Laboratory Program Guidance Manual Development | Author

Mr. Eck co-authored and managed the development of an Environmental Contract Laboratory Program – Analytical Services and Quality Assurance Guidance Manual, which included information useful both to the client's staff for project planning and to the laboratory's staff for sample analysis and data package generation. Topics in the manual included analytical methods, data package specifications, communication schemes, data quality objectives, QA/QC procedures, corrective actions, and electronic deliverable specifications.

Laboratory Auditing | Multiple Laboratories | Various Locations | Auditor

Mr. Eck has audited multiple environmental laboratories for organic, inorganic, wet chemistry, and radiochemical analysis procedures to evaluate compliance with NELAC standards, laboratory standard operating procedures, good laboratory practice, and client-specific or project-specific requirements.