UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

Form 10-Q

[X] **QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the quarterly period ended **September 30, 2019**

Or

[ ] **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(D) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from __________________ **to** __________________

Commission File No. 111596

PERMA-FIX ENVIRONMENTAL SERVICES, INC.
(Exact name of registrant as specified in its charter)

Delaware	**58-1954497**
(State or other jurisdiction of incorporation or organization)	*(IRS Employer Identification Number)*
8302 Dunwoody Place, Suite 250, Atlanta, GA	**30350**
(Address of principal executive offices)	*(Zip Code)*

(770) 587-9898
(Registrant's telephone number)

N/A
(Former name, former address and former fiscal year, if changed since last report)

Indicate by check mark whether the Registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the Registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days.
Yes [X] No [ ]

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the Registrant was required to submit such files).
Yes [X] No [ ]

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See definition of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer [ ] Accelerated Filer [ ] Non-accelerated Filer [ ] Smaller reporting company [X] Emerging growth company [ ]

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial standards provided pursuant to Section 13(a) of the Exchange Act [ ]

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes [ ] No [X]

Indicate the number of shares outstanding of each of the issuer's classes of Common Stock, as of the close of the latest practical date.

Class	Outstanding at November 4, 2019
Common Stock, $.001 Par Value	12,083,478 shares

PERMA-FIX ENVIRONMENTAL SERVICES, INC.

INDEX

			Page No.
PART I	**FINANCIAL INFORMATION**		
	Item 1.	Consolidated Financial Statements	3
		Consolidated Balance Sheets - September 30, 2019 and December 31, 2018	3
		Consolidated Statements of Operations - Three and Nine Months Ended September 30, 2019 and 2018	5
		Consolidated Statements of Comprehensive Income - Three and Nine Months Ended September 30, 2019 and 2018	6
		Consolidated Statement of Stockholders' Equity - Nine Months Ended September 30, 2019 and 2018	7
		Consolidated Statements of Cash Flows - Nine Months Ended September 30, 2019 and 2018	8
		Notes to Consolidated Financial Statements	9
	Item 2.	Management's Discussion and Analysis of Financial Condition and Results of Operations	26
	Item 3.	Quantitative and Qualitative Disclosures About Market Risk	41
	Item 4.	Controls and Procedures	41
PART II	**OTHER INFORMATION**		
	Item 1.	Legal Proceedings	41
	Item 1A.	Risk Factors	42
	Item 6.	Exhibits	42

PART I - FINANCIAL INFORMATION
ITEM 1. – Financial Statements

PERMA-FIX ENVIRONMENTAL SERVICES, INC.
Consolidated Balance Sheets

(Amounts in Thousands, Except for Share and Per Share Amounts)	September 30, 2019 (Unaudited)	December 31, 2018 (Audited)
ASSETS		
Current assets:		
Cash	$ 2,441	$ 810
Accounts receivable, net of allowance for doubtful accounts of $252 and $105, respectively	10,781	7,735
Unbilled receivables - current	9,245	3,105
Inventories	453	449
Prepaid and other assets	3,258	2,552
Current assets related to discontinued operations	99	107
Total current assets	26,277	14,758
Property and equipment:		
Buildings and land	19,920	19,782
Equipment	19,715	19,157
Vehicles	412	369
Leasehold improvements	23	23
Office furniture and equipment	1,556	1,551
Construction-in-progress	1,420	1,389
Total property and equipment	43,046	42,271
Less accumulated depreciation	(27,243)	(26,532)
Net property and equipment	15,803	15,739
Property and equipment related to discontinued operations	81	81
Operating lease right-of-use assets	2,606	—
Intangibles and other long term assets:		
Permits	8,728	8,443
Other intangible assets - net	1,107	1,278
Finite risk sinking fund (restricted cash)	11,236	15,971
Other assets	1,204	1,054
Other assets related to discontinued operations	57	118
Total assets	$ 67,099	$ 57,442

The accompanying notes are an integral part of these consolidated financial statements.

PERMA-FIX ENVIRONMENTAL SERVICES, INC.
Consolidated Balance Sheets, Continued

(Amounts in Thousands, Except for Share and per Share Amounts)	September 30, 2019 (Unaudited)	December 31, 2018 (Audited)
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$ 9,780	$ 5,497
Accrued expenses	6,179	5,014
Disposal/transportation accrual	1,659	1,542
Deferred revenue	6,239	6,595
Accrued closure costs - current	110	1,142
Current portion of long-term debt	353	1,184
Current portion of long-term debt - related party	634	—
Current portion of operating lease liabilities	237	—
Current portion of finance lease liabilities	319	181
Current liabilities related to discontinued operations	723	356
Total current liabilities	26,233	21,511
Accrued closure costs	5,877	5,608
Other long-term liabilities	—	255
Deferred tax liabilities	612	586
Long-term debt, less current portion	1,562	2,118
Long-term debt, less current portion - related party	1,360	—
Long-term operating lease liabilities, less current portion	2,406	—
Long-term finance lease liabilities, less current portion	351	268
Long-term liabilities related to discontinued operations	591	963
Total long-term liabilities	12,759	9,798
Total liabilities	38,992	31,309
Commitments and Contingencies (Note 10)		
Stockholders' Equity:		
Preferred Stock, $.001 par value; 2,000,000 shares authorized, no shares issued and outstanding	—	—
Common Stock, $.001 par value; 30,000,000 shares authorized; 12,077,418 and 11,944,215 shares issued, respectively; 12,069,776 and 11,936,573 shares outstanding, respectively	12	12
Additional paid-in capital	108,215	107,548
Accumulated deficit	(78,245)	(79,630)
Accumulated other comprehensive loss	(202)	(214)
Less Common Stock in treasury, at cost; 7,642 shares	(88)	(88)
Total Perma-Fix Environmental Services, Inc. stockholders' equity	29,692	27,628
Non-controlling interest	(1,585)	(1,495)
Total stockholders' equity	28,107	26,133
Total liabilities and stockholders' equity	$ 67,099	$ 57,442

The accompanying notes are an integral part of these consolidated financial statements.

PERMA-FIX ENVIRONMENTAL SERVICES, INC.
Consolidated Statements of Operations
(Unaudited)

(Amounts in Thousands, Except for Per Share Amounts)	Three Months Ended September 30, 2019	Three Months Ended September 30, 2018	Nine Months Ended September 30, 2019	Nine Months Ended September 30, 2018
Net revenues	$ 22,535	$ 11,984	$ 51,378	$ 37,801
Cost of goods sold	17,378	10,159	40,449	30,612
Gross profit	5,157	1,825	10,929	7,189
Selling, general and administrative expenses	2,945	2,640	8,548	8,061
Research and development	165	229	615	680
Loss (gain) on disposal of property and equipment	4	(9)	3	(34)
Income (loss) from operations	2,043	(1,035)	1,763	(1,518)
Other income (expense):				
Interest income	77	82	265	212
Interest expense	(99)	(62)	(293)	(177)
Interest expense-financing fees	(69)	(10)	(139)	(27)
Net gain on exchange offer of Series B Preferred Stock of subsidary	—	—	—	1,596
Other	(2)	—	222	—
Income (loss) from continuing operations before taxes	1,950	(1,025)	1,818	86
Income tax expense (benefit)	55	(1,342)	99	(1,272)
Income from continuing operations, net of taxes	1,895	317	1,719	1,358
Loss from discontinued operations, net of taxes of $0	(156)	(131)	(424)	(495)
Net income	1,739	186	1,295	863
Net loss attributable to non-controlling interest	(29)	(35)	(90)	(102)
Net income attributable to Perma-Fix Environmental Services, Inc. common stockholders	$ 1,768	$ 221	$ 1,385	$ 965
Net income (loss) per common share attributable to Perma-Fix Environmental Services, Inc. stockholders - basic:				
Continuing operations	$ .16	$ .03	$ .15	$ .12
Discontinued operations	(.01)	(.01)	(.03)	(.04)
Net income per common share	$ .15	$ .02	$ .12	$ .08
Net income (loss) per common share attributable to Perma-Fix Environmental Services, Inc. stockholders - diluted:				
Continuing operations	$ .16	$ .03	$ .15	$ .12
Discontinued operations	(.01)	(.01)	(.04)	(.04)
Net income per common share	$ .15	$ .02	$ .11	$ .08
Number of common shares used in computing net income per share:				
Basic	12,070	11,922	12,029	11,828
Diluted	12,123	12,027	12,061	11,909

The accompanying notes are an integral part of these consolidated financial statements.

PERMA-FIX ENVIRONMENTAL SERVICES, INC.
Consolidated Statements of Comprehensive Income
(Unaudited)

(Amounts in Thousands)	Three Months Ended September 30, 2019	Three Months Ended September 30, 2018	Nine Months Ended September 30, 2019	Nine Months Ended September 30, 2018
Net income	$ 1,739	$ 186	$ 1,295	$ 863
Other comprehensive income (loss):				
Foreign currency translation adjustment	4	18	12	(39)
Comprehensive income	1,743	204	1,307	824
Comprehensive loss attributable to non-controlling interest	(29)	(35)	(90)	(102)
Comprehensive income attributable to Perma-Fix Environmental Services, Inc. stockholders	$ 1,772	$ 239	$ 1,397	$ 926

The accompanying notes are an integral part of these consolidated financial statements.

PERMA-FIX ENVIRONMENTAL SERVICES, INC
Consolidated Statement of Stockholders' Equity
(Unaudited)
(Amounts in thousands, except for share amounts)

	Common Stock		Additional Paid-In	Common Stock Held In	Accumulated Other Comprehensive	Non-controlling Interest in	Accumulated	Total Stockholders'
	Shares	Amount	Capital	Treasury	Loss	Subsidiary	Deficit	Equity
Balance at December 31, 2018	11,944,215	$ 12	$ 107,548	$ (88)	$ (214)	$ (1,495)	$ (79,630)	$ 26,133
Net loss	—	—	—	—	—	(30)	(672)	(702)
Foreign currency translation	—	—	—	—	12	—	—	12
Issuance of Common Stock for services	24,964	—	60	—	—	—	—	60
Stock-Based Compensation	—	—	48	—	—	—	—	48
Balance at March 31, 2019	11,969,179	$ 12	$ 107,656	$ (88)	$ (202)	$ (1,525)	$ (80,302)	$ 25,551
Net income (loss)	—	—	—	—	—	(31)	289	258
Foreign currency translation	—	—	—	—	(4)	—	—	(4)
Issuance of Common Stock for services	17,902	—	62	—	—	—	—	62
Stock-Based Compensation	—	—	36	—	—	—	—	36
Issuance of Common Stock with debt	75,000	—	263	—	—	—	—	263
Issuance of warrant with debt	—	—	93	—	—	—	—	93
Balance at June 30, 2019	12,062,081	$ 12	$ 108,110	$ (88)	$ (206)	$ (1,556)	$ (80,013)	$ 26,259
Net income (loss)	—	—	—	—	—	(29)	1,768	1,739
Foreign currency translation	—	—	—	—	4	—	—	4
Issuance of Common Stock for services	15,337	—	60	—	—	—	—	60
Stock-Based Compensation	—	—	45	—	—	—	—	45
Balance at September 30, 2019	12,077,418	$ 12	$ 108,215	$ (88)	$ (202)	$ (1,585)	$ (78,245)	$ 28,107
Balance at December 31, 2017	11,738,623	$ 12	$ 106,417	$ (88)	$ (112)	$ (1,175)	$ (77,893)	$ 27,161
Adoption of accounting standards	—	—	—	—	—	—	(317)	(317)
Net income (loss)	—	—	—	—	—	(39)	135	96
Foreign currency translation	—	—	—	—	(8)	—	—	(8)
Issuance of Common Stock for services	16,074	—	60	—	—	—	—	60
Stock-Based Compensation	—	—	46	—	—	—	—	46
Balance at March 31, 2018	11,754,697	$ 12	$ 106,523	$ (88)	$ (120)	$ (1,214)	$ (78,075)	$ 27,038
Net income (loss)	—	—	—	—	—	(28)	609	581
Foreign currency translation	—	—	—	—	(49)	—	—	(49)
Issuance of Common Stock upon exercise of options	10,000	—	36	—	—	—	—	36
Issuance of Common Stock from exchange offer of Series B Preferred Stock of subsidiary	134,994	—	648	—	—	—	—	648
Issuance of Common Stock for services	15,493	—	65	—	—	—	—	65
Stock-Based Compensation	—	—	45	—	—	—	—	45
Balance at June 30, 2018	11,915,184	$ 12	$ 107,317	$ (88)	$ (169)	$ (1,242)	$ (77,466)	$ 28,364
Net income (loss)	—	—	—	—	—	(35)	221	186
Foreign currency translation	—	—	—	—	18	—	—	18
Issuance of Common Stock for services	15,063	—	66	—	—	—	—	66
Stock-Based Compensation	—	—	52	—	—	—	—	52
Balance at September 30, 2018	11,930,247	$ 12	$ 107,435	$ (88)	$ (151)	$ (1,277)	$ (77,245)	$ 28,686

The accompanying notes are an integral part of these condensed consolidated financial statements.

PERMA-FIX ENVIRONMENTAL SERVICES, INC.
Consolidated Statements of Cash Flows
(Unaudited)

(Amounts in Thousands)	Nine Months Ended September 30, 2019	2018
Cash flows from operating activities:		
Net income	$ 1,295	$ 863
Less: loss from discontinued operations, net of taxes of $0	(424)	(495)
Income from continuing operations, net of taxes	1,719	1,358
Adjustments to reconcile income from continuing operations to cash (used in) provided by operating activities:		
Depreciation and amortization	968	1,095
Amortization of debt issuance costs	139	27
Deferred tax expense (benefit)	26	(1,344)
Provision for bad debt reserves	147	22
Loss (gain) on disposal of property and equipment	3	(34)
Gain on exchange offer of Series B Preferred Stock of subsidiary	—	(1,659)
Issuance of common stock for services	182	191
Stock-based compensation	129	143
Changes in operating assets and liabilities of continuing operations		
Accounts receivable	(3,193)	(382)
Unbilled receivables	(6,140)	1,342
Prepaid expenses, inventories and other assets	500	1,272
Accounts payable, accrued expenses and unearned revenue	2,516	(983)
Cash (used in) provided by continuing operations	(3,004)	1,048
Cash used in discontinued operations	(459)	(468)
Cash (used in) provided by operating activities	(3,463)	580
Cash flows from investing activities:		
Purchases of property and equipment	(813)	(1,102)
Proceeds from sale of property and equipment	1	34
Cash used in investing activities of continuing operations	(812)	(1,068)
Cash provided by investing activities of discontinued operations	100	54
Cash used in investing activities	(712)	(1,014)
Cash flows from financing activities:		
Repayments of revolving credit borrowings	(38,378)	(40,906)
Borrowing on revolving credit	37,739	42,189
Proceeds from issuance of long-term debt - related party	2,500	—
Proceeds from finance leases	405	—
Proceeds from issuance of common stock upon exercise of options	—	36
Principal repayments of finance lease liabilities	(174)	(21)
Principal repayments of long term debt	(717)	(914)
Principal repayment of long term debt - related party	(208)	—
Payment of debt issuance costs	(112)	—
Cash provided by financing activities of continuing operations	1,055	384
Effect of exchange rate changes on cash	16	(8)
Decrease in cash and finite risk sinking fund (restricted cash)	(3,104)	(58)
Cash and finite risk sinking fund (restricted cash) at beginning of period	16,781	16,739
Cash and finite risk sinking fund (restricted cash) at end of period	$ 13,677	$ 16,681
Supplemental disclosure:		
Interest paid	$ 284	$ 173
Income taxes paid	168	160
Purchase of equipment through finance lease obligation	29	213
Issuance of Common Stock with debt	263	—
Issuance of Warrant with debt	93	—

The accompanying notes are an integral part of these consolidated financial statements.

Reference is made herein to the notes to consolidated financial statements included in our Annual Report on Form 10-K for the year ended December 31, 2018.

1. Basis of Presentation

The consolidated financial statements included herein have been prepared by the Company (which may be referred to as we, us or our), without an audit, pursuant to the rules and regulations of the Securities and Exchange Commission ("the Commission"). Certain information and note disclosures normally included in financial statements prepared in accordance with accounting principles generally accepted in the United States of America ("U.S. GAAP") have been condensed or omitted pursuant to such rules and regulations, although the Company believes the disclosures which are made are adequate to make the information presented not misleading. Further, the consolidated financial statements reflect, in the opinion of management, all adjustments (which include only normal recurring adjustments) necessary to present fairly the financial position and results of operations as of and for the periods indicated. The results of operations for the nine months ended September, 2019 are not necessarily indicative of results to be expected for the fiscal year ending December 31, 2019.

The Company suggests that these consolidated financial statements be read in conjunction with the consolidated financial statements and the notes thereto included in the Company's Annual Report on Form 10-K for the year ended December 31, 2018.

2. Summary of Significant Accounting Policies

Our accounting policies are as set forth in the notes to the December 31, 2018 consolidated financial statements referred to above.

Recently Adopted Accounting Standards

In February 2016, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") 2016-02, "Leases (Topic 842)," which requires the recognition of right-of-use ("ROU") lease assets and lease liabilities by lessees for those leases classified as operating leases under previous guidance. The original guidance required application on a modified retrospective basis with the earliest period presented. In July 2018, the FASB issued ASU 2018-11, "Targeted Improvements," to Topic 842 which included an option to not restate comparative periods in transition and elect to use the effective date of Topic 842 as the date of initial application of transition, which the Company elected. As permitted under Topic 842, the Company adopted several practical expedients that permit us to not reassess (1) whether any expired or existing contract as of the adoption date is or contain a lease, (2) lease classification for any expired or existing leases as of the adoption date, and (3) initial direct costs for any existing leases as of the adoption date. As a result of the adoption of Topic 842 on January 1, 2019, the Company recorded both operating lease right-of-use ("ROU") assets of $2,602,000 and operating lease liabilities of $2,622,000. The cumulative-effect adjustment was immaterial to our beginning accumulated deficit upon adoption of ASU 2016-02. The adoption of Topic 842 had an immaterial impact on our Consolidated Statements of Operations and Cash Flows for the nine months ended September 30, 2019. The Company's accounting for finance leases remained substantially unchanged. The Company has expanded its consolidated financial statement disclosure upon adoption of this standard (see "Note 4 – Leases").

In February 2018, FASB issued ASU 2018-02*, "*Income Statement—Reporting Comprehensive Income (Topic 220): Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income." This ASU allows for the reclassification of certain income tax effects related to the new Tax Cuts and Jobs Act legislation between "Accumulated other comprehensive income" and "Retained earnings." This ASU relates to the requirement that adjustments to deferred tax liabilities and assets related to a change in tax laws or rates be included in "Income from continuing operations", even in situations where the related items were originally recognized in "Other comprehensive income" (rather than in "Income from continuing operations"). ASU 2018-02 is effective for all entities for fiscal years beginning after December 15, 2018, and interim periods within those fiscal years, with early adoption permitted. Adoption of this ASU is to be applied either in the period of adoption or retrospectively to each period in which the effect of the change in the tax laws or rates were recognized. The adoption of ASU 2018-09 by the Company effective January 1, 2019 did not have a material impact on the Company's financial statements.

In June 2018, the FASB issued ASU No. 2018-07, "Compensation — Stock Compensation (Topic 718): Improvements to Nonemployee Share-Based Payment Accounting," which expands the scope of Topic 718 to include all share-based payment transactions for acquiring goods and services from nonemployees. ASU 2018-07 specifies that Topic 718 applies to all share-based payment transactions in which the grantor acquires goods and services to be used or consumed in its own operations by issuing share-based payment awards. ASU 2018-07 also clarifies that Topic 718 does not apply to share-based payments used to effectively provide (1) financing to the issuer or (2) awards granted in conjunction with selling goods or services to customers as part of a contract accounted for under ASC 606. ASU 2018-07 is effective for annual reporting periods, and interim periods within those years, beginning after December 15, 2018, with early adoption permitted. The adoption of ASU 2018-09 by the Company effective January 1, 2019 did not have a material impact on the Company's financial statements.

Recently Issued Accounting Standards – Not Yet Adopted

In June 2016, the FASB issued ASU No. 2016-13, "Credit Losses - Measurement of Credit Losses on Financial Instruments ("ASC 326")," which amends the current approach to estimate credit losses on certain financial assets, including trade and other receivables, available-for-sale securities, and other financial instruments. Generally, this amendment requires entities to establish a valuation allowance for the expected lifetime losses of these certain financial assets. Subsequent changes in the valuation allowance are recorded in current earnings and reversal of previous losses is permitted. In April 2019, the FASB issued ASU 2019-04, "Codification Improvements to Topic 326, Financial Instruments - Credit Losses, Topic 815, Derivatives and Hedging, and Topic 825, Financial Instruments," which, with respect to credit losses, among other things, clarifies and addresses issues related to accrued interest, transfers between classifications of loans or debt securities, recoveries, and variable interest rates. Additionally, in May 2019, the FASB issued ASU 2019-05, "Financial Instruments - Credit Losses (Topic 326): Targeted Transition Relief," which allows entities to irrevocably elect the fair value option on certain financial instruments. These standards are effective for interim and annual reporting periods beginning after December 15, 2019. Entities are required to apply the standard's provisions as a cumulative-effect adjustment to retained earnings as of the beginning of the first reporting period in which the guidance is adopted. The Company is currently assessing the impact that these standards will have on its financial statements.

In August 2018, the FASB issued ASU 2018-13, "Fair Value Measurement (Topic 820): Disclosure Framework - Changes to the Disclosure Requirements for Fair Value Measurement." ASU 2018-13 improves the disclosure requirements on fair value measurements. ASU 2018-13 is effective for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2019. Early adoption is permitted for any removed or modified disclosures. The Company is currently assessing the impact that this standard will have on its financial statements.

3. Revenue

Disaggregation of Revenue

In general, the Company's business segmentation is aligned according to the nature and economic characteristics of our services and provides meaningful disaggregation of each business segment's results of operations. The nature of the Company's performance obligations within our Treatment and Services Segments result in the recognition of our revenue primarily over time. The following tables present further disaggregation of our revenues by different categories for our Services and Treatment Segments:

Revenue by Contract Type
(In thousands)

	Three Months Ended September 30, 2019			Three Months Ended September 30, 2018		
	Treatment	Services	Total	Treatment	Services	Total
Fixed price	$ 10,081	$ 5,364	$ 15,445	$ 9,103	$ 304	$ 9,407
Time and materials	—	7,090	7,090	—	2,577	2,577
Total	$ 10,081	$ 12,454	$ 22,535	$ 9,103	$ 2,881	$ 11,984

Revenue by Contract Type
(In thousands)

	Nine Months Ended September 30, 2019			Nine Months Ended September 30, 2018		
	Treatment	Services	Total	Treatment	Services	Total
Fixed price	$ 30,079	$ 9,231	$ 39,310	$ 27,207	$ 1,040	$ 28,247
Time and materials	—	12,068	12,068	—	9,554	9,554
Total	$ 30,079	$ 21,299	$ 51,378	$ 27,207	$ 10,594	$ 37,801

Revenue by generator
(In thousands)

	Three Months Ended September 30, 2019			Three Months Ended September 30, 2018		
	Treatment	Services	Total	Treatment	Services	Total
Domestic government	$ 7,537	$ 10,155	$ 17,692	$ 6,552	$ 1,848	$ 8,400
Domestic commercial	2,535	475	3,010	2,437	718	3,155
Foreign government	—	1,804	1,804	114	294	408
Foreign commercial	9	20	29	—	21	21
Total	$ 10,081	$ 12,454	$ 22,535	$ 9,103	$ 2,881	$ 11,984

Revenue by generator
(In thousands)

	Nine Months Ended September 30, 2019			Nine Months Ended September 30, 2018		
	Treatment	Services	Total	Treatment	Services	Total
Domestic government	$ 21,986	$ 15,683	$ 37,669	$ 19,098	$ 8,231	$ 27,329
Domestic commercial	7,809	2,088	9,897	7,995	1,661	9,656
Foreign government	220	3,465	3,685	114	632	746
Foreign commercial	64	63	127	—	70	70
Total	$ 30,079	$ 21,299	$ 51,378	$ 27,207	$ 10,594	$ 37,801

Contract Balances

The timing of revenue recognition, billings, and cash collections results in accounts receivable and unbilled receivables (contract assets). The Company's contract liabilities consist of deferred revenues which represents advance payment from customers in advance of the completion of our performance obligation.

The following table represents changes in our contract assets and contract liabilities balances:

(In thousands)	September 30, 2019	December 31, 2018	Year-to-date Change ($)	Year-to-date Change (%)
Contract assets				
Account receivables, net of allowance	$ 10,781	$ 7,735	$ 3,046	39.4%
Unbilled receivables - current	9,245	3,105	6,140	197.7%
Contract liabilities				
Deferred revenue	$ 6,239	$ 6,595	$ (356)	(5.4)%

During the three and nine months ended September 30, 2019, the Company recognized revenue of $1,877,000 and $9,322,000, respectively, related to untreated waste that was in the Company's control as of December 31, 2018. During the three and nine months ended September 30, 2018, the Company recognized revenue of $1,032,000 and $6,605,000, respectively, related to untreated waste that was in the Company's control as of December 31, 2017. All revenue recognized in each period related to performance obligations satisfied within the respective period.

Incremental Costs to Obtain a Contract

Costs incurred to obtain contracts with our customers are immaterial and as a result, the Company expenses (within selling, general and administration expenses ("SG&A")) incremental costs incurred in obtaining contracts with our customers as incurred.

Remaining Performance Obligations

The Company applies the practical expedient in paragraph 606-10-50-14 of ASC 606, "Revenue from Contract with Customers," and does not disclose information about remaining performance obligations that have original expected durations of one year or less.

4. Leases

At the inception of an arrangement, the Company determines if an arrangement is, or contains, a lease based on facts and circumstances present in that arrangement. Lease classifications, recognition, and measurement are then determined at the lease commencement date.

The Company's operating lease ROU assets and operating lease liabilities represent primarily leases for office/warehouse spaces used to conduct our business. These leases have remaining terms of approximately 4 to 11 years which include one or more options to renew, with renewal terms from 3 years to 8 years. Based on the Company's reasonable certainty to exercise these renewal options, the renewal to extend the lease terms are included in valuing our ROU assets and liabilities. As most of our operating leases do not provide an implicit rate, the Company uses its incremental borrowing rate as the discount rate when determining the present value of the lease payments. The incremental borrowing rate is determined based on the Company's secured borrowing rate, lease terms and current economic environment. Some of our operating leases include both lease (rent payments) and non-lease components (maintenance costs such as cleaning and landscaping services). The Company has elected the practical expedient to account for lease component and non-lease component as a single component for all leases. Lease expense for operating leases is recognized on a straight-line basis over the lease term.

Finance leases primarily consist of processing and lab equipment for our facilities. The Company's finance leases generally have terms between two to three years and some of the leases include options to purchase the underlying assets at fair market value at the conclusion of the lease term. At September 30, 2019, assets recorded under finance leases were $1,046,000 less accumulated depreciation of $48,000, resulting in net fixed assets under finance leases of $998,000, which is recorded within net property and equipment on the Consolidated Balance Sheets.

The Company adopted the policy to not recognize ROU assets and liabilities for short term leases.

The components of lease cost for the Company's leases were as follows (in thousands):

	Three Months Ended September 30, 2019	Nine Months Ended September 30, 2019
Operating Leases:		
Lease cost	$ 114	$ 342
Finance Leases:		
Amortization of ROU assets	20	39
Interest on lease liability	15	40
	35	79
Short-term lease rent expense	41	113
Total lease cost	$ 190	$ 534

The weighted average remaining lease term and the weighted average discount rate for operating and finance leases at September 30, 2019 was:

	Operating Leases	Finance Leases
Weighted average remaining lease terms (years)	9.0	2.1
Weighted average discount rate	8.0%	11.6%

The following table reconciles the undiscounted cash flows for the operating and finance leases at September 30, 2019 to the operating and finance lease liabilities recorded on the balance sheet (in thousands):

	Operating Leases	Finance Leases
2019 Remainder	$ 108	$ 103
2020	443	433
2021	450	124
2022	459	105
2023	466	—
2024 and thereafter	1,799	—
Total undiscounted lease payments	3,725	765
Less: Imputed interest	(1,082)	(95)
Present value of lease payments	$ 2,643	$ 670
Current portion of operating lease obligations	$ 237	$ —
Long-term operating lease obligations, less current portion	$ 2,406	$ —
Current portion of finance lease obligations	$ —	$ 319
Long-term finance lease obligations, less current portion	$ —	$ 351

Supplemental cash flow and other information related to our leases were as follows (in thousands):

	Three Months Ended September 30, 2019	Nine Months Ended September 30, 2019
Cash paid for amounts included in the measurement of lease liabilities:		
Operating cash flow used in operating leases	$ 109	$ 326
Operating cash flow used in finance leases	$ 15	$ 40
Financing cash flow used in finance leases	$ 73	$ 174
ROU assets obtained in exchange for lease obligations for:		
Finance liabilities	$ 390	$ 528
Operating liabilities	$ —	$ 182

5. Intangible Assets

The following table summarizes information relating to the Company's definite-lived intangible assets:

Intangibles (amount in thousands)	Weighted Average Amortization Period (Years)	September 30, 2019			December 31, 2018		
		Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount
Patent	11	$ 740	$ (353)	$ 387	$ 728	$ (336)	$ 392
Software	3	414	(407)	7	410	(403)	7
Customer relationships	10	3,370	(2,657)	713	3,370	(2,491)	879
Permit	10	545	(545)	—	545	(538)	7
Total		$ 5,069	$ (3,962)	$ 1,107	$ 5,053	$ (3,768)	$ 1,285

The intangible assets noted above are amortized on a straight-line basis over their useful lives with the exception of customer relationships which are being amortized using an accelerated method. The Company had only one definite-lived permit that was subject to amortization. This definite-lived permit was fully amortized in the first quarter of 2019.

The following table summarizes the expected amortization over the next five years for our definite-lived intangible assets:

Year	Amount (In thousands)
2019 (remaining)	$ 61
2020	219
2121	199
2022	173
2023	132

Amortization expense relating to the definite-lived intangible assets as discussed above was $60,000 and $194,000 for the three and nine months ended September 30, 2019, respectively, and $84,000 and $253,000 for the three and nine months ended September 30, 2018, respectively.

6. Capital Stock, Stock Plans and Stock-Based Compensation

The Company has certain stock option plans under which it may awards incentive stock options ("ISOs") and/or non-qualified stock options ("NQSOs") to employees, officers, outside directors, and outside consultants.

On January 17, 2019 the Company granted 105,000 ISOs from the 2017 Stock Option Plan ("2017 Plan") to certain employees, which included our named executive officers as follows: 25,000 ISOs to our Chief Executive Officer ("CEO"); 15,000 ISOs to our Chief Financial Officer ("CFO"); and 15,000 ISOs to our Executive Vice President ("EVP") of Strategic Initiatives. The ISOs granted were for a contractual term of six years with one-fifth vesting annually over a five year period. The exercise price of the ISO was $3.15 per share, which was equal to the fair market value of the Company's Common Stock on the date of grant.

On July 25, 2019, the Company granted an aggregate of 12,000 NQSOs from the Company's 2003 Outside Directors Stock Plan ("2003 Plan") to five of the six re-elected directors at the Company's Annual Meeting of Stockholders held on July 25, 2019. Dr. Louis F. Centofanti (a Board member) was not eligible to receive options under the 2003 Plan as an employee of the Company, pursuant to the 2003 Plan. The NQSOs granted were for a contractual term of ten years with a vesting period of six months. The exercise price of the NQSO was $3.31 per share, which was equal to our closing stock price the day preceding the grant date, pursuant to the 2003 Plan.

On August 29, 2019 the Company granted an aggregate of 12,500 ISOs from the 2017 Plan to certain employees. The ISOs granted were for a contractual term of six years with one-fifth vesting annually over a five year period. The exercise price of the ISO was $3.90 per share, which was equal to the fair market value of the Company's Common Stock on the date of grant.

On January 18, 2018, the Company granted 6,000 NQSOs from the Company's 2003 Plan to a new director elected by the Company's Board of Directors ("Board") to fill a vacancy on the Board. The NQSOs granted were for a contractual term of ten years with a vesting period of six months. The exercise price of the options was $4.05 per share, which was equal to our closing stock price the day preceding the grant date, pursuant to the 2003 Plan.

On July 26, 2018, the Company granted an aggregate of 12,000 NQSOs from the Company's 2003 Plan to five of the six re-elected directors at the Annual Meeting. Dr. Louis F. Centofanti (a Board member) was not eligible to receive options under the 2003 Plan as an employee of the Company, pursuant to the 2003 Plan. The NQSOs granted were for a contractual term of ten years with a vesting period of six months. The exercise price of the NQSO was $4.30 per share, which was equal to our closing stock price the day preceding the grant date, pursuant to the 2003 Plan.

The Company granted a NQSO to Robert Ferguson on July 27, 2017 from the Company's 2017 Plan for the purchase of up to 100,000 shares of the Company's Common Stock ("Ferguson Stock Option") in connection with his work as a consultant to the Company's Test Bed Initiative ("TBI") at our Perma-Fix Northwest Richland, Inc. ("PFNWR") facility. The vesting of the Ferguson Stock Option is subject to the achievement of three separate milestones by certain dates. On January 17, 2019, the Company's Compensation and Stock Option Committee ("Compensation Committee") and Board approved an amendment to the Ferguson Stock Option whereby the vesting date for the second milestone was extended to March 31, 2020 from January 27, 2019. The 10,000 options under the first milestone were vested and exercised by Robert Ferguson in May 2018. All other terms of the Ferguson Stock Option remain unchanged.

The Company estimates fair value of stock options using the Black-Scholes valuation model. Assumptions used to estimate the fair value of stock options granted include the exercise price of the award, the expected term, the expected volatility of the Company's stock over the option's expected term, the risk-free interest rate over the option's expected term, and the expected annual dividend yield. The fair value of the options granted as discussed above and the related assumptions used in the Black-Scholes option model used to value the options granted were as follows:

	Employee Stock Option Granted	
	January 17, 2019	August 29, 2019
Weighted-average fair value per share	$ 1.42	$ 1.77
Risk -free interest rate [1]	2.58%	1.40%
Expected volatility of stock [2]	48.67%	51.38%
Dividend yield	None	None
Expected option life [3]	5.0 years	5.0 years

	Outside Director Stock Option Granted		
	July 25, 2019	January 18, 2018	July 26, 2018
Weighted-average fair value per share	$ 2.27	$ 2.55	$ 3.02
Risk -free interest rate [(1)]	2.08%	2.62%	2.98%
Expected volatility of stock [(2)]	54.28%	57.29%	55.34%
Dividend yield	None	None	None
Expected option life [(3)]	10.0 years	10.0 years	10.0 years

[(1)] The risk-free interest rate is based on the U.S. Treasury yield in effect at the grant date over the expected term of the option.

[(2)] The expected volatility is based on historical volatility from our traded Common Stock over the expected term of the option.

[(3)] The expected option life is based on historical exercises and post-vesting data.

The following table summarizes stock-based compensation recognized for the three and nine months ended September 30, 2019 and 2018 for our employee and director stock options.

Stock Options	Three Months Ended September 30,		Nine Months Ended September 30,	
	2019	2018	2019	2018
Employee Stock Options	$ 35,000	$ 37,000	$ 114,000	$ 110,000
Director Stock Options	10,000	15,000	15,000	33,000
Total	$ 45,000	$ 52,000	$ 129,000	$ 143,000

At September 30, 2019, the Company has approximately $480,000 of total unrecognized compensation cost related to unvested options for employee and directors, of which $49,000 is expected to be recognized in remaining 2019, $147,000 in 2020, $143,000 in 2021, $104,000 in 2022, $33,000 in 2023, with the remaining $4,000 in 2024. At September 30, 2019, the Company has not recognized compensation costs (fair value of approximately $148,000 at September 30, 2019) for the remaining 90,000 Ferguson Stock Option discussed above since achievement of the performance obligation under each of the two remaining milestones is uncertain at September 30, 2019.

The summary of the Company's total Stock Option Plans as of September 30, 2019 and September 30, 2018, and changes during the periods then ended, are presented below. The Company's Plans consist of the 2010 Stock Option Plan, the 2017 Plans and the 2003 Plan:

	Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Term (years)	Aggregate Intrinsic Value [2]
Options outstanding January 1, 2019	616,000	$ 4.23		
Granted	129,500	3.24		
Exercised	—	—		
Forfeited/expired	(31,800)	8.68		
Options outstanding end of period [1]	713,700	$ 3.85	4.4	$ 611,942
Options exercisable as of September 30, 2019[1]	299,200	$ 4.30	4.0	$ 188,082

	Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Term (years)	Aggregate Intrinsic Value [2]
Options outstanding January 1, 2018	624,800	$ 4.42		
Granted	18,000	4.22		
Exercised	(10,000)	3.65		
Forfeited/expired	(16,800)	11.70		
Options outstanding end of period [1]	616,000	$ 4.23	5.0	$ 279,630
Options exercisable at September 30, 2018[1]	227,333	$ 5.17	4.6	$ 72,296

(1) Options with exercise prices ranging from $2.79 to $13.35

(2) The intrinsic value of a stock option is the amount by which the market value of the underlying stock exceeds the exercise price

During the nine months ended September 30, 2019, the Company issued a total of 58,203 shares of its Common Stock under the 2003 Plan to its outside directors as compensation for serving on our Board. The Company has recorded approximately $182,000 in compensation expenses (included in selling, general and administration ("SG&A") expenses) in connection with the issuance of shares of its Common Stock to outside directors.

7. Income (Loss) Per Share

Basic income (loss) per share is calculated based on the weighted-average number of outstanding common shares during the applicable period. Diluted income (loss) per share is based on the weighted-average number of outstanding common shares plus the weighted-average number of potential outstanding common shares. In periods where they are anti-dilutive, such amounts are excluded from the calculations of dilutive earnings (loss) per share. The following table reconciles the income (loss) and average share amounts used to compute both basic and diluted income (loss) per share:

	Three Months Ended September 30, (Unaudited)		Nine Months Ended September 30, (Unaudited)	
(Amounts in Thousands, Except for Per Share Amounts)	2019	2018	2019	2018
Net income attributable to Perma-Fix Environmental Services, Inc., common stockholders:				
Income from continuing operations, net of taxes	$ 1,895	317	1,719	1,358
Net loss attributable to non-controlling interest	(29)	(35)	(90)	(102)
Income from continuing operations attributable to Perma-Fix Environmental Services, Inc. common stockholders	$ 1,924	$ 352	$ 1,809	$ 1,460
Loss from discontinuing operations attributable to Perma-Fix Environmental Services, Inc. common stockholders	(156)	(131)	(424)	(495)
Net income attributable to Perma-Fix Environmental Services, Inc. common stockholders	$ 1,768	$ 221	$ 1,385	$ 965
Basic income per share attributable to Perma-Fix Environmental Services, Inc. common stockholders	$ .15	$ .02	$ .12	$ .08
Diluted income per share attributable to Perma-Fix Environmental Services, Inc. common stockholders	$ .15	$ .02	$ .11	$ .08
Weighted average shares outstanding:				
Basic weighted average shares outstanding	12,070	11,922	12,029	11,828
Add: dilutive effect of stock options	47	105	29	81
Add: dilutive effect of warrant	6	—	3	—
Diluted weighted average shares outstanding	12,123	12,027	12,061	11,909
Potential shares excluded from above weighted average share calculations due to their anti-dilutive effect include:				
Stock options	159	83	165	83

8. Long Term Debt

Long-term debt consists of the following at September 30, 2019 and December 31, 2018:

(Amounts in Thousands)	September 30, 2019	December 31, 2018
Revolving Credit facility dated October 31, 2011, as amended, borrowings based upon eligible accounts receivable, subject to monthly borrowing base calculation, balance due on March 24, 2021. Effective interest rate for the first nine months of 2019 was 6.7%. (1)	$ —	$ 639
Term Loan dated October 31, 2011, as amended, payable in equal monthly installments of principal of $102, balance due on March 24, 2021. Effective interest rate for the first nine months of 2019 was 6.7%. (1)	1,915 (2)	2,663 (2)
Promissory Note with related party dated April 1, 2019, payable in twelve monthly installments of interest only, starting May 1, 2019 followed with twelve monthly installments of approximately $208 in principal plus accrued interest. Interest accrues at annual rate of 4.0%. (3)	1,994 (4)	—
Total debt	3,909	3,302
Less current portion of long-term debt	987	1,184
Long-term debt	$ 2,922	$ 2,118

(1) Our revolving credit facility is collateralized by our accounts receivable and our term loan is collateralized by our property, plant, and equipment. Effective July 1, 2019, monthly installment principal payment on the Term Loan was amended to approximately $35,547 from approximately $101,600. See discussion of the amendment dated June 20, 2019 to the Company's loan agreement below.

(2) Net of debt issuance costs of ($111,000) and ($80,000) at September 30, 2019 and December 31, 2018, respectively.

[3] Uncollateralized note.

[4] Net of debt discount/debt issuance of ($298,000) at September 30, 2019. The Promissory Note provides for prepayment of principal over the term of the Note without penalty. During the third quarter of 2019, the Company made prepayments of principal totaling $208,000.

Revolving Credit and Term Loan Agreement

The Company entered into an Amended and Restated Revolving Credit, Term Loan and Security Agreement, dated October 31, 2011 ("Amended Loan Agreement"), with PNC National Association ("PNC"), acting as agent and lender. The Amended Loan Agreement has been amended from time to time since the execution of the Amended Loan Agreement. The Amended Loan Agreement, as subsequently amended ("Revised Loan Agreement"), provides the Company with the following credit facility with a maturity date of March 24, 2021: (a) up to $12,000,000 revolving credit ("revolving credit") and (b) a term loan ("term loan") of approximately $6,100,000, which requires monthly installments of approximately $101,600 (based on a seven-year amortization). The maximum that the Company can borrow under the revolving credit is based on a percentage of eligible receivables (as defined) at any one time reduced by outstanding standby letters of credit and borrowing reductions that our lender may impose from time to time.

On March 29, 2019, the Company entered into an amendment to its Revised Loan Agreement with its lender under the credit facility which provided the following:

- waived the Company's failure to meet the minimum quarterly fixed charge coverage ratio ("FCCR") requirement for the fourth quarter of 2018;
- waived the quarterly FCCR testing requirement for the first quarter of 2019;
- revised the methodology to be used in calculating the FCCR in each of the second and third quarters of 2019 (with continued requirement to maintain a minimum 1.15:1 ratio in each of the quarters);
- revised the minimum Tangible Adjusted Net Worth requirement (as defined in the Revised Loan Agreement) from $26,000,000 to $25,000,000;
- eliminated the London InterBank Offer Rate ("LIBOR") interest payment option of paying annual rate of interest due on our term loan and revolving credit until the Company becomes compliant with its FCCR requirement again. Prior to this amendment, the Company had the option of paying annual rate of interest due on the revolving credit at prime (5.00% at September 30, 2019) plus 2% or LIBOR plus 3% and the term loan at prime plus 2.5% or LIBOR plus 3.5%;
- provided consent for the $2,500,000 loan that the Company entered into with Robert Ferguson on April 1, 2019 discussed below. The Company is not allowed to make any principal prepayment on this loan until it receives the restricted finite risk sinking funds of approximately $5,000,000 held as collateral by AIG Specialty Insurance Company ("AIG") under our financial assurance policy resulting from the closure of the Company's East Tennessee Material and Energy Corporation ("M&EC") facility (see "Note 10 – Commitments and Contingencies – Insurance" for a discussion of the receipt of this $5,000,000 in finite risk sinking funds on July 22, 2019); and
- revised the annual rate used to calculate the Facility Fee (as defined in the Revised Loan Agreement) (unused revolving credit line fee) from 0.250% to 0.375%.

On June 20, 2019, the Company entered into another amendment to its Revised Loan Agreement with its lender under the credit facility which provided the following, among other things:

- removed the FCCR calculation requirement for the second, third and fourth quarter of 2019. Starting in the first quarter of 2020, the Company will again be required to maintain a minimum FCCR of not less than 1.15 to 1.0 for the four quarter period ending March 31, 2020 and for each fiscal quarter thereafter;
- requires the Company to maintain a minimum Adjusted Earnings Before Interest, Taxes, Depreciation and Amortization ("Adjusted EBITDA" as defined in the Amendment) of at least (i) $475,000 for the one quarter period ending June 30, 2019; (ii) $2,350,000 for the two quarter period ending September 30, 2019; and (iii) $3,750,000 for the three quarter period ending December 31, 2019;
- immediate release of $450,000 of the $1,000,000 indefinite reduction in borrowing availability that our lender had previously imposed. Release of another $300,000 of the remaining $550,000 reduction in borrowing availability by our lender if the Company meets its minimum Adjusted EBITDA requirement for the quarter ending September 30, 2019 as discussed above, in addition to the Company having received no less than $4,000,000 of the restricted finite risk sinking funds held as collateral by AIG under our financial assurance policy. Our lender will release the final $250,000 reduction in borrowing availability if the Company meets its Adjusted EBITDA requirement for the three quarter period ending December 31, 2019; and
- reduce the term loan monthly principal payment starting July 1, 2019 from $101,600 to approximately $35,547, with the remaining balance of the term loan due at the maturity of the Revised Loan Agreement which is March 24, 2021.

Most of the other terms of the Revised Loan Agreement, as amended, remain principally unchanged. In connection with amendment dated March 29, 2019 and June 20, 2019, the Company paid its lender a fee of $20,000 and $50,000, respectively.

Pursuant to the Revised Loan Agreement, as amended, the Company may terminate the Revised Loan Agreement, as amended, upon 90 days' prior written notice upon payment in full of its obligations under the Revised Loan Agreement, as amended. No early termination fee shall apply if the Company pays off its obligations after March 23, 2019.

At September 30, 2019, the borrowing availability under our revolving credit was approximately $9,319,000, based on our eligible receivables and includes an indefinite reduction of borrowing availability of $550,000 that the Company's lender has imposed. Our borrowing availability under our revolving credit was also reduced by outstanding standby letters of credit totaling approximately $2,639,000.

The Company's credit facility with PNC contains certain financial covenants, along with customary representations and warranties. A breach of any of these financial covenants, unless waived by PNC, could result in a default under our credit facility allowing our lender to immediately require the repayment of all outstanding debt under our credit facility and terminate all commitments to extend further credit. As discussed above, our lender waived/removed our FCCR testing requirement for each of the quarters in 2019. The Company met its "Adjusted EBITDA" minimum requirement in the second and third quarters of 2019 in accordance to the amendment dated June 20, 2019 discussed above. Additionally, the Company met its remaining financial covenant requirements in the first, second and third quarters of 2019. As a result of the Company meeting the "Adjusted EBITDA" minimum requirement for the third quarter of 2019, the Company's lender is expected to release $300,000 of the $550,000 reduction in borrowing availability subsequent to the filing of the Company's Form 10-Q for the third quarter 2019.

Loan and Securities Purchase Agreement, Promissory Note and Subordination Agreement

On April 1, 2019, the Company completed a lending transaction with Robert Ferguson (the "Lender"), whereby the Company borrowed from the Lender the sum of $2,500,000 pursuant to the terms of a Loan and Security Purchase Agreement and promissory note (the "Loan"). The Lender is a shareholder of the Company. The Lender also currently serves as a consultant to the Company in connection with the TBI at its PFNWR subsidiary. The proceeds from the Loan were used for general working capital purposes. The Loan is unsecured, with a term of two years with interest payable at a fixed interest rate of 4.00% per annum. The Loan provides for monthly payments of accrued interest only during the first year of the Loan, with the first interest payment due May 1, 2019 and monthly payments of approximately $208,333 in principal plus accrued interest starting in the second year of the Loan. The Loan also allows for prepayment of principal payments over the term of the Loan without penalty. During the third quarter of 2019, the Company made total prepayments in principal of $208,000. In connection with the above Loan, the Lender agreed under the terms of the Loan and a Subordination Agreement with our credit facility lender, to subordinate payment under the Loan, and agreed that the Loan will be junior in right of payment to the credit facility in the event of default or bankruptcy or other insolvency proceeding by us. In connection with this capital raise transaction described above and consideration for us receiving the Loan, the Company issued a Warrant (the "Warrant") to the Lender to purchase up to 60,000 shares of our Common Stock at an exercise price of $3.51 per share, which was the closing bid price for a share of our Common Stock on NASDAQ.com immediately preceding the execution of the Loan and Warrant. The Warrant is exercisable six months from April 1, 2019 and expires on April 1, 2024. The fair value of the Warrant was estimated to be approximately $93,000 using the Black-Scholes option pricing model with the following assumptions: 50.76% volatility, risk free interest rate of 2.31%, an expected life of five years and no dividends. As further consideration for this capital raise transaction relating to the Loan, the Company issued 75,000 shares of its Common Stock to the Lender. The Company determined the fair value of the 75,000 shares of Common Stock to be approximately $263,000 which was based on the closing bid price for a share of the Company's Common Stock on NASDAQ.com immediately preceding the execution of the Loan, pursuant to the Loan and Securities Purchase Agreement. The fair value of the Warrant and Common Stock and the related closing fees incurred totaling approximately $398,000 from the transaction was recorded as debt discount/debt issuance costs, which is being amortized over the term of the loan as interest expense – financing fees. The 75,000 shares of Common Stock, the Warrant and the 60,000 shares of Common Stock that may be purchased under the Warrant will be and was issued in a private placement that was exempt from registration under Rule 506 and/or Sections 4(a)(2) and 4(a)(5) of the Securities Act of 1933, as amended (the "Act") and bear a restrictive legend against resale except in a transaction registered under the Act or in a transaction exempt from registration thereunder.

Upon default, the Lender will have the right to elect to receive in full and complete satisfaction of the Company's obligations under the Loan either: (a) the cash amount equal to the sum of the unpaid principal balance owing under the loan and all accrued and unpaid interest thereon (the "Payoff Amount") or (b) upon meeting certain conditions, the number of whole shares of the Company's Common Stock (the "Payoff Shares") determined by dividing the Payoff Amount by the dollar amount equal to the closing bid price of our Common Stock on the date immediately prior to the date of default, as reported or quoted on the primary nationally recognized exchange or automated quotation system on which our Common Stock is listed; provided however, that the dollar amount of such closing bid price shall not be less than $3.51, the closing bid price for our Common Stock as disclosed on NASDAQ.com immediately preceding the signing of this loan agreement.

If issued, the Payoff Shares will not be registered and the Lender will not be entitled to registration rights with respect to the Payoff Shares. The aggregate number of shares, warrant shares, and Payoff Shares that are or will be issued to the Lender pursuant to the Loan, together with the aggregate shares of the Company's Common Stock and other voting securities owned by the Lender or which may be acquired by the Lender as of the date of issuance of the Payoff Shares, shall not exceed the number of shares of the Company's Common Stock equal to 14.9% of the number of shares of the Company's Common Stock issued and outstanding as of the date immediately prior to the default, less the number of shares of the Company's Common Stock owned by the Lender immediately prior to the date of such default plus the number of shares of our Common Stock that may be acquired by the Lender under warrants and/or options outstanding immediately prior to the date of such default.

9. M&EC

The Company has completed the closure and decommissioning activities of its M&EC facility in accordance with M&EC's license and permit requirements.

At September 30, 2019, total accrued closure liabilities for our M&EC subsidiary totaled approximately $110,000 which are recorded as current liabilities. The Company recorded an additional $165,000 in closure costs and current closure liabilities in each of the first and second quarters of 2019 due to finalization of closure requirements. The following reflects changes to the closure liabilities for the M&EC facility from year end 2018:

Amounts in thousands		
Balance as of December 31, 2018	$	1,142
Adjustment to closure liability		330
Spending		(1,362)
Balance as of September 30, 2019	$	110

10. Commitments and Contingencies

Hazardous Waste

In connection with our waste management services, we process both hazardous and non-hazardous waste, which we transport to our own, or other, facilities for destruction or disposal. As a result of disposing of hazardous substances, in the event any cleanup is required, we could be a potentially responsible party for the costs of the cleanup notwithstanding any absence of fault on our part.

Legal Matters

In the normal course of conducting our business, we are involved in various litigation. We are not a party to any litigation or governmental proceeding which our management believes could result in any judgments or fines against us that would have a material adverse effect on our financial position, liquidity or results of future operations.

Insurance

The Company has a 25-year finite risk insurance policy entered into in June 2003 ("2003 Closure Policy") with AIG, which provides financial assurance to the applicable states for our permitted facilities in the event of unforeseen closure. The 2003 Closure Policy, as amended, provided for a maximum allowable coverage of $39,000,000 which included available capacity to allow for annual inflation and other performance and surety bond requirements. As a result of the closure of the Company's M&EC facility, on July 22, 2019, AIG released $5,000,000 of the finite risk sinking funds held as collateral under the 2003 Closure Policy to the Company. The finite risk sinking funds received by the Company are to be used for general working capital needs. In conjunction with the release of the finite risk sinking funds by AIG, total coverage under the 2003 Closure Policy was amended from $30,549,000 to $19,314,000. Additionally, the maximum coverage allowable under the 2003 Closure Policy was amended from $39,000,000 to approximately $28,177,000 which includes available capacity to allow for annual inflation and other performance and surety bond requirements. At September 30, 2019 and December 31, 2018, finite risk sinking funds contributed by the Company related to the 2003 Closure Policy which is included in other long term assets on the accompanying Consolidated Balance Sheets totaled $11,236,000 and $15,971,000, respectively, which included interest earned of $1,765,000 and $1,500,000 on the finite risk sinking funds as of September 30, 2019 and December 31, 2018, respectively. Interest income for the three and nine months ended September 30, 2019 was approximately $77,000 and $265,000, respectively. Interest income for the three and nine months ended September 30, 2018 was approximately $82,000 and $212,000, respectively. If the Company so elects, AIG is obligated to pay us an amount equal to 100% of the finite risk sinking fund account balance in return for complete release of liability from both us and any applicable regulatory agency using this policy as an instrument to comply with financial assurance requirements.

Letter of Credits and Bonding Requirements

From time to time, the Company is required to post standby letters of credit and various bonds to support contractual obligations to customers and other obligations, including facility closures. At September 30, 2019, the total amount of standby letters of credit outstanding was approximately $2,639,000 and the total amount of bonds outstanding was approximately $28,213,000.

11. Discontinued Operations

The Company's discontinued operations consist of all our subsidiaries included in our Industrial Segment: (1) subsidiaries divested in 2011 and prior, (2) two previously closed locations, and (3) our Perma-Fix of South Georgia, Inc. ("PFSG") facility is in closure status, which final closure is subject to regulatory approval of necessary plans and permits.

The Company's discontinued operations had net losses of $156,000 and $131,000 for the three months ended September 30, 2019 and 2018, respectively (net of taxes of $0 for each period) and net losses of $424,000 and $495,000 for the nine months ended September 30, 2019 and 2018, respectively, (net of taxes of $0 for each period). The losses were primarily due to costs incurred in the administration and continued monitoring of our discontinued operations. Net loss for the nine months ended September 30, 2018 included an increase of approximately $50,000 in remediation reserve recorded in the second quarter of 2018 for our Perma-Fix of Dayton ("PFD") subsidiary due to reassessment of the remediation reserve. The Company's discontinued operations had no revenues for each of the periods noted above.

The following table presents the major class of assets of discontinued operations as of September 30, 2019 and December 31, 2018. No assets and liabilities were held for sale at each of the periods noted.

(Amounts in Thousands)	September 30, 2019	December 31, 2018
Current assets		
Other assets	$ 99	$ 107
Total current assets	99	107
Long-term assets		
Property, plant and equipment, net [1]	81	81
Other assets	57	118
Total long-term assets	138	199
Total assets	$ 237	$ 306
Current liabilities		
Accounts payable	$ 19	$ 10
Accrued expenses and other liabilities	286	296
Environmental liabilities	418	50
Total current liabilities	723	356
Long-term liabilities		
Closure liabilities	132	126
Environmental liabilities	459	837
Total long-term liabilities	591	963
Total liabilities	$ 1,314	$ 1,319

[1] net of accumulated depreciation of $10,000 for each period presented.

The Company's discontinued operations included a note receivable in the original amount of approximately $375,000 recorded in May 2016 resulting from the sale of property at our Perma-Fix of Michigan, Inc. subsidiary. This note requires 60 equal monthly installment payments by the buyer of approximately $7,250 (which includes interest). At September 30, 2019, the outstanding amount on this note receivable totaled approximately $138,000, of which approximately $81,000 is included in "Current assets related to discontinued operations" and approximately $57,000 is included in "Other assets related to discontinued operations" in the accompanying Consolidated Balance Sheets.

12. Operating Segments

In accordance with ASC 280, "Segment Reporting", the Company defines an operating segment as a business activity: (1) from which we may earn revenue and incur expenses; (2) whose operating results are regularly reviewed by the chief operating decision maker ("CODM") to make decisions about resources to be allocated to the segment and assess its performance; and (3) for which discrete financial information is available.

Our reporting segments are defined as below:

TREATMENT SEGMENT, which includes:

- nuclear, low-level radioactive, mixed waste (containing both hazardous and low-level radioactive constituents), hazardous and non-hazardous waste treatment, processing and disposal services primarily through three uniquely licensed and permitted treatment and storage facilities; and
- R&D activities to identify, develop and implement innovative waste processing techniques for problematic waste streams.

SERVICES SEGMENT, which includes:

- Technical services, which include:
  - professional radiological measurement and site survey of large government and commercial installations using advanced methods, technology and engineering;
  - integrated Occupational Safety and Health services including IH assessments; hazardous materials surveys, e.g., exposure monitoring; lead and asbestos management/abatement oversight; indoor air quality evaluations; health risk and exposure assessments; health & safety plan/program development, compliance auditing and training services; and OSHA citation assistance;
  - global technical services providing consulting, engineering, project management, waste management, environmental, and decontamination and decommissioning field, technical, and management personnel and services to commercial and government customers; and
  - on-site waste management services to commercial and governmental customers.
- Nuclear services, which include:
  - technology-based services including engineering, decontamination and decommissioning ("D&D"), specialty services and construction, logistics, transportation, processing and disposal;
  - remediation of nuclear licensed and federal facilities and the remediation cleanup of nuclear legacy sites. Such services capability includes: project investigation; radiological engineering; partial and total plant D&D; facility decontamination, dismantling, demolition, and planning; site restoration; logistics; transportation; and emergency response; and
- A company owned equipment calibration and maintenance laboratory that services, maintains, calibrates, and sources (i.e., rental) health physics, IH and customized NIOSH instrumentation.
- A company owned gamma spectroscopy laboratory for the analysis of oil and gas industry solids and liquids.

MEDICAL SEGMENT, which includes: Research and Development ("R&D") of the Company's medical isotope production technology by our majority-owned Polish subsidiary, Perma-Fix Medical S.A. and its wholly-owned subsidiary Perma-Fix Medical Corporation ("PFM Corporation") (together known as "PF Medical" or the Medical Segment). The Company's Medical Segment has not generated any revenue as it remains in the R&D stage. The Medical Segment has substantially reduced its R&D activities due to the need for capital to fund these activities. The Company anticipates that the Medical Segment will not resume full R&D activities until the necessary capital is obtained through its own credit facility or additional equity raise or obtains partners willing to provide funding for its R&D. All costs incurred by the Medical Segment are reflected within R&D in the accompanying consolidated financial statements.

Our reporting segments exclude our corporate headquarters and our discontinued operations (see "Note 11 – Discontinued Operations") which do not generate revenues.

The table below presents certain financial information of our operating segments for the three and nine months ended September 30, 2019 and 2018 (in thousands).

Segment Reporting for the Quarter Ended September 30, 2019

	Treatment	Services	Medical	Segments Total	Corporate [1]	Consolidated Total
Revenue from external customers	$ 10,081	$ 12,454	—	$ 22,535	$ —	$ 22,535
Intercompany revenues	75	38	—	113	—	—
Gross profit	3,338	1,819	—	5,157	—	5,157
Research and development	85	—	74	159	6	165
Interest income	—	—	—	—	77	77
Interest expense	(19)	(5)	—	(24)	(75)	(99)
Interest expense-financing fees	—	—	—	—	(69)	(69)
Depreciation and amortization	243	79	—	322	6	328
Segment income (loss) before income taxes	2,244	1,193	(74)	3,363	(1,413)	1,950
Income tax expense	55	—	—	55	—	55
Segment income (loss)	2,189	1,193	(74)	3,308	(1,413)	1,895
Expenditures for segment assets	470	31	—	501	—	501

Segment Reporting for the Quarter Ended September 30, 2018

	Treatment	Services	Medical	Segments Total	Corporate [1]	Consolidated Total
Revenue from external customers	$ 9,103	$ 2,881	—	$ 11,984	$ —	$ 11,984
Intercompany revenues	174	16	—	190	—	—
Gross profit	1,564	261	—	1,825	—	1,825
Research and development	126	—	88	214	15	229
Interest income	—	—	—	—	82	82
Interest expense	(8)	(1)	—	(9)	(53)	(62)
Interest expense-financing fees	—	—	—	—	(10)	(10)
Depreciation and amortization	234	122	—	356	8	364
Segment income (loss) before income taxes	506	(224)	(88)	194	(1,219)	(1,025)
Income tax (benefit) expense	(1,342)[3]	—	—	(1,342)	—	(1,342)
Segment income (loss)	1,848	(224)	(88)	1,536	(1,219)	317
Expenditures for segment assets	525	22	—	547	1	548

Segment Reporting for the Nine Months Ended September 30, 2019

	Treatment	Services	Medical	Segments Total	Corporate [1]	Consolidated Total
Revenue from external customers	$ 30,079	$ 21,299	—	$ 51,378	$ —	$ 51,378
Intercompany revenues	83	101	—	184	—	—
Gross profit	8,921	2,008	—	10,929	—	10,929
Research and development	367	—	228	595	20	615
Interest income	—	—	—	—	265	265
Interest expense	(66)	(18)	—	(84)	(209)	(293)
Interest expense-financing fees	—	—	—	—	(139)	(139)
Depreciation and amortization	713	236	—	949	19	968
Segment income (loss) before income taxes	5,731	318	(228)	5,821	(4,003)	1,818
Income tax expense	99	—	—	99	—	99
Segment income (loss)	5,632	318	(228)	5,722	(4,003)	1,719
Expenditures for segment assets	764	49	—	813	—	813

Segment Reporting for the Nine Months Ended September 30, 2018

	Treatment	Services	Medical	Segments Total	Corporate [1]	Consolidated Total
Revenue from external customers	$ 27,207	$ 10,594	—	$ 37,801	$ —	$ 37,801
Intercompany revenues	463	55	—	518	—	—
Gross profit	5,867	1,322	—	7,189	—	7,189
Research and development	355	—	259	614	66	680
Interest income	—	—	—	—	212	212
Interest expense	(16)	(2)	—	(18)	(159)	(177)
Interest expense-financing fees	—	—	—	—	(27)	(27)
Depreciation and amortization	702	367	—	1,069	26	1,095
Segment income (loss) before income taxes	4,279[2]	(194)	(259)	3,826	(3,740)	86
Income tax (benefit) expense	(1,277)[3]	—	—	(1,277)	5	(1,272)
Segment income (loss)	5,556	(194)	(259)	5,103	(3,745)	1,358
Expenditures for segment assets	1,016	82	—	1,098	4	1,102

[1] Amounts reflect the activity for corporate headquarters not included in the segment information.

[2] Amounts included a net gain of $1,596,000 recorded resulting from the exchange offer of the Series B Preferred Stock of our M&EC subsidiary which was consummated on May 30, 2018.

[3] Amounts included a tax benefit recorded in the amount of approximately $1,380,000 during the third quarter. (see "Note 13 – Income Taxes" below).

13. Income Taxes

The Company had income tax expense of $55,000 and income tax benefit of $1,342,000 for continuing operations for the three months ended September 30, 2019 and 2018, respectively and income tax expense of $99,000 and income tax benefit of $1,272,000 for the nine months ended September 30, 2019 and 2018, respectively. Our effective tax rates were approximately 2.8% and 130.9% for the three months ended September 30, 2019 and 2018, respectively, and 5.4% and 1,479.1% for the nine months ended September 30, 2019 and 2018, respectively. The Company's tax rate for each periods discussed above was impacted by the Company's full valuation on its net deferred tax assets. Additionally, during the third quarter of 2018, the Company recorded a tax benefit in the amount of approximately $1,380,000 resulting from the release of a portion of the valuation allowance on deferred tax assets related to indefinite-lived net operating losses generated due to the closure of our M&EC facility. The small tax expense for the third quarter of 2019 was comprised of state tax expense for separate company filing states and the increase in the deferred tax liability related to the amortization of indefinite

lived intangible assets.

Item 2. Management's Discussion and Analysis of Financial Condition and Results of Operations

Forward-looking Statements

Certain statements contained within this report may be deemed "forward-looking statements" within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended (collectively, the "Private Securities Litigation Reform Act of 1995"). All statements in this report other than a statement of historical fact are forward-looking statements that are subject to known and unknown risks, uncertainties and other factors, which could cause actual results and performance of the Company to differ materially from such statements. The words "believe," "expect," "anticipate," "intend," "will," and similar expressions identify forward-looking statements. Forward-looking statements contained herein relate to, among other things,

- demand for our services;
- continue to focus on expansion into both commercial and international markets to increase revenues;
- full implementation of our strategic plan;
- improve revenue and liquidity and increase shareholder values upon full implementation of strategic plan;
- improvement to working capital;
- reductions in the level of government funding in future years;
- R&D activity of our Medical Segment;
- reducing operating costs;
- expect to meet our financial covenant requirements in the next twelve months;
- cash flow requirements;
- government funding for our services;
- may not have liquidity to repay debt if our lender accelerates payment of our borrowings;
- our cash flows from operations, our available liquidity from our credit facility, and remaining cash on hand are sufficient to service our operations;
- manner in which the applicable government will be required to spend funding to remediate various sites;
- funding operations;
- fund capital expenditures from cash from operations and/or financing;
- fund remediation expenditures for sites from funds generated internally;
- compliance with environmental regulations;
- potential effect of being a PRP;
- potential sites for violations of environmental laws and remediation of our facilities;
- continuation of contracts with federal government;
- release of $300,000 of the $550,000 reduction in borrowing availability;
- loss of contracts; and
- necessary capital for Medical Segment.

While the Company believes the expectations reflected in such forward-looking statements are reasonable, it can give no assurance such expectations will prove to be correct. There are a variety of factors, which could cause future outcomes to differ materially from those described in this report, including, but not limited to:

- general economic conditions;
- material reduction in revenues;
- ability to meet PNC covenant requirements;
- inability to collect in a timely manner a material amount of receivables;
- increased competitive pressures;
- inability to maintain and obtain required permits and approvals to conduct operations;
- public not accepting our new technology;
- inability to develop new and existing technologies in the conduct of operations;
- inability to maintain and obtain closure and operating insurance requirements;
- inability to retain or renew certain required permits;
- discovery of additional contamination or expanded contamination at any of the sites or facilities leased or owned by us or our subsidiaries which would result in a material increase in remediation expenditures;
- delays at our third party disposal site can extend collection of our receivables greater than twelve months;
- refusal of third party disposal sites to accept our waste;
- changes in federal, state and local laws and regulations, especially environmental laws and regulations, or in interpretation of such;
- requirements to obtain permits for TSD activities or licensing requirements to handle low level radioactive materials are limited or lessened;
- potential increases in equipment, maintenance, operating or labor costs;
- management retention and development;
- financial valuation of intangible assets is substantially more/less than expected;
- the requirement to use internally generated funds for purposes not presently anticipated;
- inability to continue to be profitable on an annualized basis;
- inability of the Company to maintain the listing of its Common Stock on the NASDAQ;
- terminations of contracts with federal agencies or subcontracts involving federal agencies, or reduction in amount of waste delivered to the Company under the contracts or subcontracts;
- renegotiation of contracts involving the federal government;
- federal government's inability or failure to provide necessary funding to remediate contaminated federal sites;
- disposal expense accrual could prove to be inadequate in the event the waste requires re-treatment;
- inability to raise capital on commercially reasonable terms;
- inability to increase profitable revenue;
- lender refuses to waive non-compliance or revise our covenant so that we are in compliance; and
- risk factors and other factors set forth in "Special Note Regarding Forward-Looking Statements" contained in the Company's 2018 Form 10-K and the "Forward-Looking Statements" contained in the "Management's Discussion and Analysis of Financial Condition and Results of Operations" of the Company's Form 10-Q for the quarters ended March 31, 2019 and June 30, 2019.

Overview

Revenue increased $10,551,000 or 88.0% to $22,535,000 for the three months ended September 30, 2019 from $11,984,000 for the corresponding period of 2018. The revenue increase was primarily in the Services Segments where revenue increased approximately $9,573,000 or 332.3%. The increase in our Services Segment revenue was primarily due to awards of several contracts/task orders for project work since the latter part of the first quarter of 2019 resulting from the success of our implemented strategic plan in winning contract bids. Treatment Segment revenue increased $978,000 or 10.7%. Total gross profit increased $3,332,000 or 182.6%. Gross profit for the third quarter of 2018 included closure costs recorded in the amount of approximately $1,093,000 in connection with the closure of our East Tennessee Materials and Energy Corporation ("M&EC") facility which we have completed in accordance with M&EC's license and permit requirements. Selling, General, and Administrative ("SG&A") expenses increased $305,000 or 11.6% for the three months ended September 30, 2019 as compared to the corresponding period of 2018.

Revenue increased $13,577,000 or 35.9% to $51,378,000 for the nine months ended September 30, 2019 from $37,801,000 for the corresponding period of 2018. The revenue increase was primarily in the Services Segments where revenue increased approximately $10,705,000 or 101.0%. The increase in our Services Segment revenue was primarily due to awards of several contracts/task orders for project work since the latter part of the first quarter of 2019 resulting from the success of our implemented strategic plan in winning contract bids as discussed above. Treatment Segment revenue increased $2,872,000 or 10.6%. Total gross profit increased $3,740,000 or 52.0%. Gross profit for the first nine months of 2019 and 2018 included closure costs recorded in the amount of approximately $330,000 and $2,308,000, respectively, in connection with the closure of our M&EC facility as discussed above. SG&A expenses increased $487,000 or 6.0% for the nine months ended September 30, 2019 as compared to the corresponding period of 2018.

As discussed previously, we have completed the closure and decommissioning activities of our M&EC facility in accordance with M&EC's license and permit requirements. As a result of this closure, on July 22, 2019, we received a release of $5,000,000 of finite risk sinking funds held as collateral under our financial assurance closure policy dated June 2003 from AIG Specialty Insurance Company ("AIG") (see "Liquidity and Capital Resources – Insurance" within this "Management's Discussion and Analysis of Financial Condition and Results of Operations ("MD&A")" for a discussion of the release of this finite risk sinking funds. Additionally, on April 1, 2019, we consummated a lending transaction with Mr. Robert Ferguson resulting in the receipt of $2,500,000 in loan proceeds (see "Liquidity and Capital Resources – Financing Activities" within this MD&A for a discussion of this loan transaction). Both of these transactions have improved our working capital. At September 30, 2019, we had a working capital of approximately $44,000 as compared to a working capital deficit of $6,753,000 at December 31, 2018.

Business Environment and Outlook

Our Treatment and Services Segments' business continues to be heavily dependent on services that we provide to governmental clients directly as the contractor or indirectly as a subcontractor. We believe demand for our services will continue to be subject to fluctuations due to a variety of factors beyond our control, including the economic conditions and the manner in which the applicable government will be required to spend funding to remediate various sites. In addition, our governmental contracts and subcontracts relating to activities at governmental sites in the United States are generally subject to termination or renegotiation on 30 days' notice at the government's option. Significant reductions in the level of governmental funding or specifically mandated levels for different programs that are important to our business could have a material adverse impact on our business, financial position, results of operations and cash flows. As previously disclosed, our Medical Segment (which has not generated any revenues to date) substantially reduced its research and development ("R&D") activities due to the need for capital to fund such activities. Our Medical Segment continues to seek various sources in order to raise this capital or partners willing to provide the funding for its R&D activities. We anticipate that our Medical Segment R&D activities will be limited until the necessary capital is obtained through its own credit facility or additional equity raise or obtaining partners willing to provide funding for its R&D activities. If the Medical Segment is unable to raise the necessary capital, the Medical Segment could be required to further reduce, delay or eliminate its R&D program.

We are continually reviewing methods to raise additional capital to supplement our liquidity requirements, when needed, and reducing our operating costs. We are committed to further reducing operating costs to bring them in line with revenue levels, when needed. Further, our recently implemented strategic plan, which includes increasing our overall contract bid/win ratio and expansion into both commercial and international markets to increase revenues in our Treatment and Services Segments to offset the uncertainties of government spending in the United States of America and, has thus far been successful. As previously disclosed, during May 2019, our wholly-owned subsidiary, Perma-Fix Canada, Inc. (within our Services Segment) entered into a Task Order Agreement ("TOA") with the Canadian Nuclear Laboratories, LTD. ("CNL"), with a value of approximately $8,500,000 (U.S dollar), for remediation work at specific sites within Ontario, Canada through 2019. Additionally, in late July 2019, we entered into an additional TOA with CNL with a value of approximately $3,000,000 (U.S. dollar), for remediation work at additional specific sites within Ontario, Canada through 2019. The TOAs with the Canadian government generally provide that the government may terminate a TOA at any time for convenience. We believe that the full implementation of our strategic plan should be accomplished over the next few years, and when fully implemented, we believe it should improve our revenue and liquidity and increase our shareholder values.

Results of Operations

The reporting of financial results and pertinent discussions are tailored to our three reportable segments: The Treatment, Services, and Medical Segments. Our Medical Segment has not generated any revenue and all costs incurred are included within R&D.

Summary – Three and Nine Months Ended September 30, 2019 and 2018

	Three Months Ended September 30,				Nine Months Ended September 30,			
Consolidated (amounts in thousands)	2019	%	2018	%	2019	%	2018	%
Net revenues	$ 22,535	100.0	$ 11,984	100.0	$ 51,378	100.0	$ 37,801	100.0
Cost of goods sold	17,378	77.1	10,159	84.8	40,449	78.7	30,612	81.0
Gross profit	5,157	22.9	1,825	15.2	10,929	21.3	7,189	19.0
Selling, general and administrative	2,945	13.1	2,640	22.0	8,548	16.6	8,061	21.3
Research and development	165	.7	229	1.9	615	1.3	680	1.8
(Loss) gain on disposal of property and equipment	4	—	(9)	(.1)	3	—	(34)	(.1)
Income (loss) from operations	2,043	9.1	(1,035)	(8.6)	1,763	3.4	(1,518)	(4.0)
Interest income	77	.3	82	.6	265	.5	212	.6
Interest expense	(99)	(.4)	(62)	(.5)	(293)	(.6)	(177)	(.5)
Interest expense-financing fees	(69)	(.3)	(10)	(.1)	(139)	(.3)	(27)	(.1)
Net gain on exchange offer of Series B Preferred Stock	—	—	—	—	—	—	1,596	4.2
Other	(2)	—	—	—	222	.5	—	—
Income (loss) from continuing operations before taxes	1,950	8.7	(1,025)	(8.6)	1,818	3.5	86	.2
Income tax expense (benefit)	55	.3	(1,342)	(11.2)	99	.2	(1,272)	(3.4)
Income from continuing operations	$ 1,895	8.4	$ 317	2.6	$ 1,719	3.3	$ 1,358	3.6

Revenues

Consolidated revenues increased $10,551,000 for the three months ended September 30, 2019, compared to the three months ended September 30, 2018, as follows:

(In thousands)	2019	% Revenue	2018	% Revenue	Change	% Change
Treatment						
Government waste	$ 7,077	31.4	$ 6,332	52.9	$ 745	11.8
Hazardous/non-hazardous [(1)]	1,309	5.8	1,348	11.2	(39)	(2.9)
Other nuclear waste	1,695	7.5	1,423	11.9	272	19.1
Total	10,081	44.7	9,103	76.0	978	10.7
Services						
Nuclear services	11,979	53.2	2,061	17.2	9,918	481.2
Technical services	475	2.1	820	6.8	(345)	(42.1)
Total	12,454	55.3	2,881	24.0	9,573	332.3
Total	$ 22,535	100.0	$ 11,984	100.0	$ 10,551	88.0

[(1)] Includes wastes generated by government clients of $460,000 and $334,000 for the three month ended September 30, 2019 and the corresponding period of 2018, respectively.

Treatment Segment revenue increased $978,000 or 10.7 % for the three months ended September 30, 2019 over the same period in 2018. The increase in revenue generated from government clients was primarily due to higher averaged price waste resulting from revenue mix. The increase in other nuclear waste revenue was primarily due to higher waste volume. Services Segment revenue increased by $9,573,000 or 332.3% in the three months ended September 30, 2019 from the corresponding period of 2018. The increase in our Services Segment revenue was primarily due to awards of several contracts/task orders for project work since the latter part of the first quarter of 2019 resulting from the success of our implemented strategic plan in winning contract bids as previously disclosed. Our Services Segment revenues are project based; as such, the scope, duration and completion of each project vary. As a result, our Services Segment revenues are subject to differences relating to timing and project value.

Consolidated revenues increased $13,577,000 for the nine months ended September 30, 2019, as compared to the nine months ended September 30, 2018, as follows:

(In thousands)	2019	% Revenue	2018	% Revenue	Change	% Change
Treatment						
Government waste	$ 20,478	39.8	$ 18,038	47.7	$ 2,440	13.5
Hazardous/non-hazardous [(1)]	4,616	9.0	4,188	11.1	428	10.2
Other nuclear waste	4,985	9.7	4,981	13.2	4	0.1
Total	30,079	58.5	27,207	72.0	2,872	10.6
Services						
Nuclear services	19,211	37.4	8,655	22.9	10,556	122.0
Technical services	2,088	4.1	1,939	5.1	149	7.7
Total	21,299	41.5	10,594	28.0	10,705	101.0
Total	$ 51,378	100.0	$ 37,801	100.0	$ 13,577	35.9

[(1)] Includes wastes generated by government clients of $1,728,000 and $1,174,000 for the nine month ended September 30, 2019 and the corresponding period of 2018, respectively.

Treatment Segment revenue increased $2,872,000 or 10.6 % for the nine months ended September 30, 2019 over the same period in 2018. The revenue increase was primarily due to higher revenue generated from government clients due to higher averaged price waste resulting from revenue mix. The increase in hazardous/non-hazardous waste revenue was primarily due to higher waste volume. Services Segment revenue increased by $10,705,000 or 101.0% in the nine months ended September 30, 2019 from the corresponding period of 2018. As previously discussed, the increase in our Services Segment revenue was primarily due to awards of several contracts/task orders for project work since the latter part of the first quarter of 2019 resulting from the success of our implemented strategic plan in winning contract bids. Our Services Segment revenues are project based; as such, the scope, duration and completion of each project vary. As a result, our Services Segment revenues are subject to differences relating to timing and project value.

Cost of Goods Sold

Cost of goods sold increased $7,219,000 for the quarter ended September 30, 2019, as compared to the quarter ended September 30, 2018, as follows:

(In thousands)	2019	% Revenue	2018	% Revenue	Change
Treatment	$ 6,743	66.9	$ 7,539	82.8	$ (796)
Services	10,635	85.4	2,620	90.9	8,015
Total	$ 17,378	77.1	$ 10,159	84.8	$ 7,219

Cost of goods sold for the Treatment Segment decreased by $796,000 or approximately 10.6%. Treatment Segment costs of goods sold for the third quarter of 2018 included additional closure costs recorded in the amount of $1,093,000 for our M&EC facility due to changes in estimated closure costs in connection with the closure of the facility. Excluding the closure costs, Treatment Segment costs increased $297,000 or 4.6% primarily due to higher revenue. Treatment Segment variable costs increased by approximately $275,000 primarily in disposal, transportation, material and supplies and outside services. Our overall fixed costs were higher by approximately $22,000 resulting primarily from higher salaries and payroll related expenses of approximately $176,000 from increased headcount. This increase in fixed costs was partially offset by lower fixed costs in general expenses of approximately $154,000 in various categories. Services Segment cost of goods sold increased $8,015,000 or 305.9% primarily due to higher revenue as discussed above. The increase in Services Segment's cost of goods sold was primarily in salaries and payroll related expenses, travel, and outside services expenses totaling approximately $7,808,000, higher material and supply/transportation/regulatory costs totaling approximately $161,000 and higher general expenses of approximately $89,000 in various categories. The total overall higher cost was partially offset by lower depreciation expenses of approximately $43,000 as a number of assets became fully depreciated by end of 2018. Included within cost of goods sold is depreciation and amortization expense of $317,000 and $350,000 for the three months ended September 30, 2019, and 2018, respectively.

Cost of goods sold increased $9,837,000 for the nine months ended September 30, 2019, as compared to the nine months ended September 30, 2018, as follows:

(In thousands)	2019	% Revenue	2018	% Revenue	Change
Treatment	$ 21,158	70.3	$ 21,340	78.4	$ (182)
Services	19,291	90.6	9,272	87.5	10,019
Total	$ 40,449	78.7	$ 30,612	81.0	$ 9,837

Cost of goods sold for the Treatment Segment decreased by $182,000 or approximately 0.9%. Treatment Segment costs of goods sold for the nine months ended September 30, 2019 and 2018 included additional closure costs recorded in the amount of approximately $330,000 and $2,308,000, respectively, for our M&EC facility in connection with the closure of the facility. Excluding the closure costs recorded in both periods, Treatment Segment costs increased $1,796,000 or 9.4% due to higher revenue. Excluding the closure costs recorded, Treatment Segment's variable costs increased by approximately $1,192,000 primarily in disposal, transportation and material and supplies costs. Treatment Segment overall fixed costs were higher by approximately $604,000 resulting from the following: salaries and payroll related expenses were higher by approximately $1,020,000 resulting from higher headcount; general expenses were lower by approximately $287,000 in various categories; and maintenance expense was lower by approximately $129,000. Services Segment cost of goods sold increased $10,019,000 or 108.1% primarily due to higher revenue as discussed above. The increase in Services Segment's cost of goods sold was primarily in salaries and payroll related expenses, travel, and outside services expenses totaling approximately $9,871,000, higher material and supply/transportation/regulatory costs totaling approximately $196,000 and higher general expenses of approximately $76,000 in various categories. The total overall higher cost was partially offset by lower depreciation expenses of approximately $124,000 as a number of assets became fully depreciated by end of 2018. Included within cost of goods sold is depreciation and amortization expense of $934,000 and $1,044,000 for the nine months ended September 30, 2019, and 2018, respectively.

Gross Profit

Gross profit for the quarter ended September 30, 2019 increased $3,332,000 over the same period of 2018, as follows:

(In thousands)		2019	% Revenue		2018	% Revenue		Change
Treatment	$	3,338	33.1	$	1,564	17.2	$	1,774
Services		1,819	14.6		261	9.1		1,558
Total	$	5,157	22.9	$	1,825	15.2	$	3,332

Excluding the $1,093,000 in closure costs recorded in the third quarters of 2018 within our Treatment Segment's costs of goods sold in connection with the closure of the M&EC facility as discussed above, our Treatment Segment had an increase in gross profit of $681,000 or 25.6% and gross margin increased to 33.1% from 29.2% primarily due to higher revenue. In the Services Segment, the increase in gross profit of $1,558,000 or 596.9% and gross margin to 14.6% from 9.1% was primarily due to the increase in revenue as discussed above. Additionally, our overall Services Segment gross margin is impacted by our current projects which are competitively bid on and will therefore, have varying margin structures.

Gross profit for the nine months ended September 30, 2019 increased $3,740,000 over the same period in 2018, as follows:

(In thousands)		2019	% Revenue		2018	% Revenue		Change
Treatment	$	8,921	29.7	$	5,867	21.6	$	3,054
Services		2,008	9.4		1,322	12.5		686
Total	$	10,929	21.3	$	7,189	19.0	$	3,740

As discussed previously, Treatment Segment's cost of goods sold for the nine months ended September 30, 2019 and 2018 included $330,000 and $2,308,000 in closure costs recorded in connection with the closure of the M&EC facility, respectively. Excluding the closure costs recorded in each of the periods, our Treatment Segment had a gross profit increase of $1,076,000 or 13.2% and gross margin increased to 30.8% from 30.0% primarily due to higher revenue. In the Services Segment, gross profit increased $686,000 or 51.9% and gross margin decreased to 9.4% from 12.5%. Our overall Services Segment gross margin is impacted by our current projects which are competitively bid on and will therefore, have varying margin structures.

SG&A

SG&A expenses increased $305,000 for the three months ended September 30, 2019, as compared to the corresponding period for 2018, as follows:

(In thousands)		2019	% Revenue		2018	% Revenue		Change
Administrative	$	1,340	—	$	1,223	—	$	117
Treatment		988	9.8		923	10.1		65
Services		617	5.0		494	17.1		123
Total	$	2,945	13.1	$	2,640	22.0	$	305

The increase in Administrative SG&A was due to the following: payroll related expenses were higher by $66,000 primarily due to the accrual of estimated expenses related to the Company's incentive plans; outside services expenses were higher by $30,000 resulting from more consulting/business matters and travel and general expenses were higher by a total of approximately $21,000. Treatment SG&A was higher primarily due to the following: general expenses were higher by approximately $42,000 in various categories; travel expenses were higher by $5,000; payroll related costs were higher by approximately $25,000; bad debt expenses were higher by $22,000; and outside services expenses were lower by $29,000 resulting from fewer business/consulting matters. Services Segment SG&A increased by approximately $123,000 primarily due to the following: bad debt expenses were higher by $74,000; outside services expenses were higher by approximately $66,000 resulting from more consulting/subcontract matters; general expenses were higher by approximately $17,000 in various categories; travel expenses were higher by approximately $9,000; and payroll related expenses were lower by $43,000. Included in SG&A expenses is depreciation and amortization expense of $11,000 and $14,000 for the three months ended September 30, 2019, and 2018, respectively.

SG&A expenses increased $487,000 for the nine months ended September 30, 2019, as compared to the corresponding period for 2018, as follows:

(In thousands)	2019	% Revenue	2018	% Revenue	Change
Administrative	$ 3,905	—	$ 3,700	—	$ 205
Treatment	2,966	9.9	2,824	10.4	142
Services	1,677	7.9	1,537	14.5	140
Total	$ 8,548	16.6	$ 8,061	21.3	$ 487

The increase in Administrative SG&A was primarily due to the following: salary/payroll related/healthcare costs were higher by approximately $165,000 which includedaccrual of estimated expenses related to the Company's incentive plans; general expenses were higher by $31,000 in various categories; and travel expenses were higher by approximately $9,000. Treatment SG&A was higher primarily due to the following: salaries and payroll related expenses were higher by approximately $200,000; travel expenses were higher by approximately $22,000; bad debt expenses were higher by $19,000; outside services expenses were lower by $91,000 resulting from fewer consulting/subcontract matters; and general expenses were lower by approximately $8,000. Services Segment SG&A increased by $140,000 primarily due to the following: higher general expenses by approximately $104,000 in various categories; higher bad debt expenses of $106,000; higher travel expense of $20,000; higher outside services expenses of $50,000; and lower salaries and payroll related expenses totaling approximately $140,000. Services Segment's general expenses for the nine months ended September 30, 2018 included a reduction in rent expense recorded in the second quarter of 2018 resulting from the end of our lease term for our business center office in Knoxville, Tennessee (which was not renewed with the same lessor). Included in SG&A expenses is depreciation and amortization expense of $34,000 and $51,000 for the nine months ended September 30, 2019 and 2018, respectively.

R&D

R&D expenses decreased $64,000 and $65,000 for the three and nine months ended September 30, 2019, respectively, as compared to the corresponding period of 2018.

	Three Months Ended September 30,			Nine Months Ended September 30,		
(In thousands)	2019	2018	Change	2019	2018	Change
Administrative	$ 6	$ 15	$ 15	$ 20	$ 66	$ (46)
Treatment	85	126	(41)	367	355	12
Services	—	—	—	—	—	—
PF Medical	74	88	(14)	228	259	(31)
Total	$ 165	$ 229	$ (64)	$ 615	$ 680	$ (65)

R&D costs consist primarily of employee salaries and benefits, laboratory costs, third party fees, and other related costs associated with the development of new technologies and technological enhancement of new potential waste treatment processes. As disclosed previously, our Medical Segment has ceased a substantial portion of its R&D activities due to the need for substantial capital to fund such activities and we anticipate that our Medical Segment will not resume any substantial R&D activities until it obtains the necessary funding.

Interest Income

Interest income decreased $5,000 for the three months ended September 30, 2019 as compared to the corresponding period of 2018 and increased $53,000 for the nine months ended September 30, 2019 as compared to the corresponding period of 2018. The decrease in interest income in the third quarter of 2019 was primarily due to lower interest earned from reduced finite risk sinking fund balance resulting from the release of $5,000,000 in finite risk sinking funds in July 2019 in connection with the M&EC facility closure as previously discussed. The increase in interest income for the nine month ended September 30, 2019 as compared to the corresponding period of 2018 was primarily due to higher interest earned on the finite risk sinking funds resulting from higher interest rates; however, the higher interest income earned from higher interest rates was partially reduced by the lower finite risk sinking fund balance as discussed above for the third quarter ended of 2019.

Interest Expense

Interest expense increased approximately $37,000 and $116,000 for the three and nine months ended September 30, 2019, respectively, as compared to the corresponding period of 2018. The increases in both periods were primarily due to interest on new finance leases which we entered into in 2019 and interest incurred from the April 1, 2019 loan that we entered into with Robert Ferguson in the amount of $2,500,000 (see "Liquidity and Capital Resources – Financing Activities" for further information of this debt).

Interest Expense- Financing Fees

Interest expense-financing fees increased approximately $59,000 and $112,000 for the three and nine months ended September 30, 2019, respectively, as compared to the corresponding period of 2018. The increase was primarily due to debt discount/debt issuance costs amortized as financing fees in connection with the issuance of our Common Stock and a purchase Warrant as consideration for the Company receiving the $2,500,000 loan from Robert Ferguson (See "Liquidity and Capital Resources – Financing Activities" for further information of this debt discount).

Income Taxes

We had income tax expense of $55,000 and income tax benefit of $1,342,000 for continuing operations for the three months ended September 30, 2019 and 2018, respectively and income tax expense of $99,000 and income tax benefit of $1,272,000 for the nine months ended September 30, 2019 and 2018, respectively. Our effective tax rates were approximately 2.8% and 130.9% for the three months ended September 30, 2019 and 2018, respectively, and 5.4% and 1,479.1% for the nine months ended September 30, 2019 and 2018, respectively. Our tax rate for each periods discussed above was impacted by the full valuation on our net deferred tax assets. Additionally, during the third quarter of 2018, we recorded a tax benefit in the amount of approximately $1,380,000 resulting from the release of a portion of the valuation allowance on deferred tax assets related to indefinite-lived net operating losses generated due to the closure of our M&EC facility. The small tax expense for the third quarter of 2019 was comprised of state tax expense for separate company filing states and the increase in the deferred tax liability related to the amortization of indefinite lived intangible assets.

Discontinued Operations and Divestitures

The Company's discontinued operations consist of all our subsidiaries included in our Industrial Segment: (1) subsidiaries divested in 2011 and prior, (2) two previously closed locations, and (3) our Perma-Fix of South Georgia, Inc. ("PFSG") facility is in closure status, which final closure is subject to regulatory approval of necessary plans and permits.

Our discontinued operations had no revenue for the three and nine months ended September 30, 2019 and the corresponding period of 2018. We incurred net losses of $156,000 and $424,000 for our discontinued operations for the three and nine months ended September 30, 2019, respectively. We incurred net losses of $131,000 and $495,000 for our discontinued operations for the three and nine months ended September 30, 2018, respectively. Our net loss for the nine months ended September 30, 2018 included an increase of approximately $50,000 in remediation reserve recorded in the second quarter of 2018 for our Perma-Fix of Dayton ("PFD") subsidiary due to reassessment of the remediation reserve. Our discontinued operations had no revenues for each of the periods noted above.

Liquidity and Capital Resources

Our cash flow requirements during the nine months ended September 30, 2019 were primarily financed by our operations, credit facility availability, loan proceeds of $2,500,000 from a loan that we consummated on April 1, 2019 (see "Financing Activities" below for further information of the agreement and note) , and the receipt of the $5,000,000 in finite risk sinking funds from AIG in July 2019 resulting from the closure of our M&EC facility (see a discussion of this finite risk sinking in "Insurance" below). Our cash flow requirements for the next twelve months will consist primarily of general working capital needs, scheduled principal payments on our debt obligations, remediation projects, and planned capital expenditures. We plan to fund these requirements from our operations, credit facility availability, and remaining cash on hand. We continue to explore all sources of increasing our capital to supplement our liquidity requirements, when needed, and to improve our revenue and working capital. We are continually reviewing operating costs and are committed to further reducing operating costs to bring them in line with revenue levels, when necessary. Although there are no assurances, we believe that our cash flows from operations, our available liquidity from our credit facility, and our remaining cash on hand should be sufficient to fund our operations for the next twelve months. As previously discussed, our recently implemented strategic plan, which includes expansion into international markets and increasing our contract bid/win ratio, has thus far been successful, which we believe will continue to help improve our results and liquidity. We further anticipate that over the next few years, we should be able to fully implement our strategic plan. As previously disclosed, our Medical Segment substantially reduced its R&D activities due to the need for capital to fund such activities. We continue to seek various sources of potential funding for our Medical Segment. We anticipate that our Medical Segment will not resume full R&D activities until it obtains the necessary funding through obtaining its own credit facility or additional equity raise or obtaining new partners willing to fund its R&D activities. If the Medical Segment is unable to raise the necessary capital, the Medical Segment could be required to further reduce, delay or eliminate its R&D program.

The following table reflects the cash flow activities during the first nine months of 2019:

(In thousands)		
Cash used in operating activities of continuing operations	$	(3,004)
Cash used in operating activities of discontinued operations		(459)
Cash used in investing activities of continuing operations		(812)
Cash provided by investing activities of discontinued operations		100
Cash provided by financing activities of continuing operations		1,055
Effect of exchange rate changes in cash		16
Decrease in cash and finite risk sinking fund (restricted cash)	$	(3,104)

At September 30, 2019, we were in a positive cash position with no revolving credit balance. At September 30, 2019, we had cash on hand of approximately $2,441,000, which includes account balances of our foreign subsidiaries totaling approximately $549,000.

Operating Activities

Accounts receivable, net of allowances for doubtful accounts, totaled $10,781,000 at September 30, 2019, an increase of $3,046,000 from the December 31, 2018 balance of $7,735,000. The increase was primarily due to higher revenue and the timing of invoicing and timing of accounts receivable collection. We provide a variety of payment terms to our customers; therefore, our accounts receivable are impacted by these terms and the related timing of accounts receivable collections.

Accounts payable, totaled $9,780,000 at September 30, 2019, an increase of $4,283,000 from the December 31, 2018 balance of $5,497,000. The increase in accounts payable was also attributed to the significant increase in revenue within our Services Segment in the first nine months of 2019. Additionally, our accounts payable are impacted by the timing of payments as we are continually managing payment terms with our vendors to maximize our cash position throughout all segments.

We had a working capital of $44,000 (which included working capital of our discontinued operations) at September 30, 2019 as compared to a working capital deficit of $6,753,000 at December 31, 2018. The improvement in our working capital was primarily the result of the receipt of $5,000,000 of finite risk sinking funds on July 22, 2019 previously held as collateral under our 2003 Closure Policy resulting from the closure of our M&EC facility (see "Liquidity and Capital Resources – Insurance" below for a discussion of this finite risk sinking funds) and the $2,500,000 loan proceeds received from the consummation of the Robert Ferguson loan on April 1, 2019 (see "Financing Activities" below for a discussion of this loan). Also, the increases in our accounts and unbilled receivables resulting from the significant increase in our revenue have positively impacted our working capital. Additionally, the reduction in the monthly principal term loan payment from approximately $101,600 to $35,547 resulting from an amendment that we entered into with our lender on June 20, 2019 has improved our working capital (Liquidity and Capital Resources – Financing Activities" below for a discussion of this amendment to our loan agreement). Our working capital was negatively impacted by the reclassification of approximately $377,000 in remediation reserves within our discontinued operations from long-term to current for anticipated spending within the next twelve months. Additionally, our working capital was negatively impacted by the reclassification of principal payments due within the next twelve months on the Robert Ferguson loan from long-term to current.

Investing Activities

For the nine months ended September 30, 2019, our purchases of capital equipment totaled approximately $842,000, of which $29,000 was financed, with the remaining funded from cash from operations and our credit facility. These expenditures were made primarily for our Treatment Segment. We have budgeted approximately $1,500,000 for 2019 capital expenditures for our Treatment and Services Segments to maintain operations and regulatory compliance requirements and continued footprint expansion for one of our Treatment Segment facilities. Certain of these budgeted projects may either be delayed until later years or deferred altogether. We plan to fund our capital expenditures from cash from operations and/or financing. The initiation and timing of projects are also determined by financing alternatives or funds available for such capital projects.

Financing Activities

We entered into an Amended and Restated Revolving Credit, Term Loan and Security Agreement, dated October 31, 2011 ("Amended Loan Agreement"), with PNC National Association ("PNC"), acting as agent and lender. The Amended Loan Agreement, as subsequently amended ("Revised Loan Agreement"), provides us with the following credit facility with a maturity date of March 24, 2021: (a) up to $12,000,000 revolving credit ("revolving credit") and (b) a term loan ("term loan") of approximately $6,100,000, which requires monthly installments of approximately $101,600 (based on a seven-year amortization). The maximum that we can borrow under the revolving credit is based on a percentage of eligible receivables (as defined) at any one time reduced by outstanding standby letters of credit and borrowing reductions that our lender may impose from time to time.

On March 29, 2019, we entered into an amendment to our Revised Loan Agreement with our lender under the credit facility which provided the following:

- waived our failure to meet the minimum quarterly fixed charge coverage ratio ("FCCR") requirement for the fourth quarter of 2018;
- waived the quarterly FCCR testing requirement for the first quarter of 2019;

- revised the methodology to be used in calculating the FCCR in each of the second and third quarters of 2019 (with continued requirement to maintain a minimum 1.15:1 ratio in each of the quarters);
- revised the minimum Tangible Adjusted Net Worth requirement (as defined in the Revised Loan Agreement) from $26,000,000 to $25,000,000;
- eliminated the London Inter Bank Offer Rate ("LIBOR") interest payment option of paying annual rate of interest due on our term loan and revolving credit until we become compliant with our FCCR requirement again. Prior to this amendment, we had the option of paying annual rate of interest due on the revolving credit at prime (5.00% at September 30, 2019) plus 2% or LIBOR plus 3% and the term loan at prime plus 2.5% or LIBOR plus 3.5%;
- provided consent for the $2,500,000 loan that we entered into with Robert Ferguson as discussed below. We are not allowed to make any principal prepayment on this loan until we receive the restricted finite risk sinking funds of approximately $5,000,000 held as collateral by AIG under our financial assurance policy (see "Insurance" below for a discussion of the receipt of this $5,000,000 finite risk sinking funds below); and
- revised the annual rate used to calculate the Facility Fee (as defined in the Revised Loan Agreement) (unused revolving credit line fee) from 0.250% to 0.375%.

On June 20, 2019, we entered into another amendment to our Revised Loan Agreement with our lender under the credit facility which provided the following, among other things:

- removal of the FCCR calculation requirement for the second, third and fourth quarter of 2019. Starting in the first quarter of 2020, we will again be required to maintain a minimum FCCR of not less than 1.15 to 1.0 for the four quarter period ending March 31, 2020 and for each fiscal quarter thereafter;
- requires us to maintain a minimum Adjusted Earnings Before Interest, Taxes, Depreciation and Amortization ("Adjusted EBITDA" as defined in the Amendment) of at least (i) $475,000 for the one quarter period ending June 30, 2019; (ii) $2,350,000 for the two quarter period ending September 30, 2019; and (iii) $3,750,000 for the three quarter period ending December 31, 2019;
- immediate release of $450,000 of the $1,000,000 indefinite reduction in borrowing availability that PNC had previously imposed. Our lender will release another $300,000 of the remaining $550,000 reduction in borrowing availability if we meet our minimum Adjusted EBITDA requirement for the quarter ending September 30, 2019 as discussed above, in addition to us having received no less than $4,000,000 of the restricted finite risk sinking funds held as collateral by AIG under our financial assurance policy (see "Insurance" below for a discussion of the receipt of this finite risk sinking funds below). Our lender will release the final $250,000 reduction in borrowing availability if we meet our Adjusted EBITDA requirement for the three quarter period ending December 31, 2019; and
- reduce the term loan monthly principal payment starting July 1, 2019 from $101,600 to approximately $35,547, with the remaining balance of the term loan due at the maturity of the Revised Loan Agreement which is March 24, 2021.

Most of the other terms of the Revised Loan Agreement, as amended, remain principally unchanged. In connection with amendment dated March 29, 2019 and June 20, 2019, we paid our lender a fee of $20,000 and $50,000, respectively.

Pursuant to the Revised Loan Agreement, as amended, we may terminate the Revised Loan Agreement, as amended, upon 90 days' prior written notice upon payment in full of its obligations under the Revised Loan Agreement, as amended. No early termination fee shall apply if we pay off our obligations after March 23, 2019.

At September 30, 2019, the borrowing availability under our revolving credit was approximately $9,319,000, based on our eligible receivables and includes an indefinite reduction of borrowing availability of $550,000 that our lender has imposed. Our borrowing availability under our revolving credit was also reduced by outstanding standby letters of credit totaling approximately $2,639,000.

Our credit facility with our lender contains certain financial covenants, along with customary representations and warranties. A breach of any of these financial covenants, unless waived by our lender, could result in a default under our credit facility allowing our lender to immediately require the repayment of all outstanding debt under our credit facility and terminate all commitments to extend further credit. As discussed above, our lender waived/removed our FCCR testing requirement for each of the quarters in 2019. We met our "Adjusted EBITDA" minimum requirement in the second and third quarters of 2019 in accordance to the amendment dated June 20, 2019 as discussed above. Additionally, we met our remaining financial covenant requirements in the first, second and third quarters of 2019. As a result of us meeting the "Adjusted EBITDA" minimum requirement for the third quarter of 2019, our lender is expected to release $300,000 of the $550,000 reduction in borrowing availability subsequent to the filing of our Form 10-Q for the third quarter 2019. We expect to meet our financial covenant requirements in the next twelve months; however, if we fail to meet any of our financial covenant requirements and our lender does not further waive the non-compliance or revise our covenant so that we are in compliance, our lender could accelerate the repayment of borrowings under our credit facility. In the event that our lender accelerates the payment of our borrowings, we may not have sufficient liquidity to repay our debt under our credit facility and other indebtedness.

On April 1, 2019, we completed a lending transaction with Robert Ferguson (the "Lender"), whereby we borrowed from the Lender the sum of $2,500,000 pursuant to the terms of a Loan and Security Purchase Agreement and promissory note (the "Loan"). The Lender is a shareholder of the Company. The Lender also currently serves as a consultant to the Company in connection with the Test Bed Initiatives at our Perma-Fix Northwest Richland, Inc. facility. The proceeds from the Loan were used for general working capital purposes. The Loan is unsecured, with a term of two years with interest payable at a fixed interest rate of 4.00% per annum. The Loan provides for monthly payments of accrued interest only during the first year of the Loan, with the first interest payment due May 1, 2019 and monthly payments of approximately $208,333 in principal plus accrued interest starting in the second year of the Loan. The Loan also provides for prepayment of principal payments over the term of the Loan without penalty. During the third quarter of 2019, we made total prepayments in principal of $208,000. In connection with the above Loan, the Lender agreed under the terms of the Loan and a Subordination Agreement with our credit facility lender, to subordinate payment under the Loan, and agreed that the Loan will be junior in right of payment to the credit facility in the event of default or bankruptcy or other insolvency proceeding by us. In connection with this capital raise transaction described above and consideration for us receiving the Loan, we issued a Warrant (the "Warrant") to the Lender to purchase up to 60,000 shares of our Common Stock at an exercise price of $3.51 per share, which was the closing bid price for a share of our Common Stock on NASDAQ.com immediately preceding the execution of the Loan and Warrant. The Warrant is exercisable six months from April 1, 2019 and expires on April 1, 2024. The fair value of the Warrant was estimated to be approximately $93,000 using the Black-Scholes option pricing model with the following assumptions: 50.76% volatility, risk free interest rate of 2.31%, an expected life of five years and no dividends. As further consideration for this capital raise transaction relating to the Loan, we also issued 75,000 shares of our Common Stock to the Lender. We determined the fair value of the 75,000 shares of Common Stock to be approximately $263,000 which was based on the closing bid price for a share of our Common Stock on NASDAQ.com immediately preceding the execution of the Loan, pursuant to the Loan and Securities Purchase Agreement. The fair value of the Warrant and Common Stock and the related closing fees incurred totaling approximately $398,000 from the transaction was recorded as a debt discount/debt issuance costs, which is being amortized over the term of the loan as interest expense – financing fees. The 75,000 shares of Common Stock, the Warrant and the 60,000 shares of Common Stock that may be purchased under the Warrant will be and was issued in a private placement that was exempt from registration under Rule 506 and/or Sections 4(a)(2) and 4(a)(5) of the Securities Act of 1933, as amended (the "Act") and bear a restrictive legend against resale except in a transaction registered under the Act or in a transaction exempt from registration thereunder.

Upon default, the Lender will have the right to elect to receive in full and complete satisfaction of our obligations under the Loan either: (a) the cash amount equal to the sum of the unpaid principal balance owing under the loan and all accrued and unpaid interest thereon (the "Payoff Amount") or (b) upon meeting certain conditions, the number of whole shares of our Common Stock (the "Payoff Shares") determined by dividing the Payoff Amount by the dollar amount equal to the closing bid price of our Common Stock on the date immediately prior to the date of default, as reported or quoted on the primary nationally recognized exchange or automated quotation system on which our Common Stock is listed; provided however, that the dollar amount of such closing bid price shall not be less than $3.51, the closing bid price for our Common Stock as disclosed on NASDAQ.com immediately preceding the signing of this loan agreement.

If issued, the Payoff Shares will not be registered and the Lender will not be entitled to registration rights with respect to the Payoff Shares. The aggregate number of shares, warrant shares, and Payoff Shares that are or will be issued to the Lender pursuant to the Loan, together with the aggregate shares of our Common Stock and other voting securities owned by the Lender or which may be acquired by the Lender as of the date of issuance of the Payoff Shares, shall not exceed the number of shares of our Common Stock equal to 14.9% of the number of shares of our Common Stock issued and outstanding as of the date immediately prior to the default, less the number of shares of our Common Stock owned by the Lender immediately prior to the date of such default plus the number of shares of our Common Stock that may be acquired by the Lender under warrants and/or options outstanding immediately prior to the date of such default.

On May 13, 2019, we filed a shelf registration statement on Form S-3 with the U.S. Securities and Exchange Commission ("SEC"), which was declared effective by the SEC on May 22, 2019 at 4:00 p.m. The shelf registration statement gives us the ability to sell up to 2,500,000 shares of our Common Stock from time to time and through one or more methods of distribution, subject to market conditions and the Company's capital needs at that time. The terms of any offering under the registration statement will be established at the time of the offering and be set forth in an accompanying prospectus or prospectus supplement relating to the offering. The Company does not have any immediate plans or current commitments to issue shares under the registration statement. This is not an offer to sell or a solicitation of an offer to buy, nor shall there be a sale of securities in any state or jurisdiction in which such offer, solicitation or sale would be unlawful prior to registration or qualification under the securities laws of such state or jurisdiction.

Insurance

We have a 25-year finite risk insurance policy entered into in June 2003 ("2003 Closure Policy") with AIG, which provides financial assurance to the applicable states for our permitted facilities in the event of unforeseen closure. The 2003 Closure Policy, as amended, provided for a maximum allowable coverage of $39,000,000 which included available capacity to allow for annual inflation and other performance and surety bond requirements. As a result of the closure of the Company's M&EC facility, on July 22, 2019, AIG released $5,000,000 of the finite risk sinking funds held as collateral under the 2003 Closure Policy to us. The finite risk sinking funds received by us are to be used for general working capital needs. In conjunction with the release of the finite risk sinking funds by AIG, total coverage under the 2003 Closure Policy was amended from $30,549,000 to $19,314,000. Additionally, the maximum allowable coverage under the 2003 Closure Policy was amended from $39,000,000 to approximately $28,177,000 which includes available capacity to allow for annual inflation and other performance and surety bond requirements. At September 30, 2019 and December 31, 2018, finite risk sinking funds contributed by us to the 2003 Closure Policy which is included in other long term assets on the accompanying Consolidated Balance Sheets totaled $11,236,000 and $15,971,000, respectively, which included interest earned of $1,765,000 and $1,500,000 on the finite risk sinking funds as of September 30, 2019 and December 31, 2018, respectively. Interest income for the three and nine months ended September 30, 2019 was approximately $77,000 and $265,000, respectively. Interest income for the three and nine months ended September 30, 2018 was approximately $82,000 and $212,000, respectively. If we so elects, AIG is obligated to pay us an amount equal to 100% of the finite risk sinking fund account balance in return for complete release of liability from both us and any applicable regulatory agency using this policy as an instrument to comply with financial assurance requirements.

Off Balance Sheet Arrangements

From time to time, we are required to post standby letters of credit and various bonds to support contractual obligations to customers and other obligations, including facility closures. At September 30, 2019, the total amount of standby letters of credit outstanding was approximately $2,639,000 and the total amount of bonds outstanding was approximately $28,213,000. We also provide closure and post-closure requirements through a financial assurance policy for certain of our Treatment Segment facilities through AIG (See a discussion of this financial assurance policy above).

Critical Accounting Policies and Estimates

In February 2016, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") 2016-02, "Leases (Topic 842)," which requires the recognition of lease assets and lease liabilities by lessees for those leases classified as operating leases under previous guidance. The original guidance required application on a modified retrospective basis with the earliest period presented. In July 2018, the FASB issued ASU 2018-11, "Targeted Improvements," to Topic 842 which included an option to not restate comparative periods in transition and elect to use the effective date of Topic 842 as the date of initial application of transition, which we elected. As a result of the adoption of Topic 842 on January 1, 2019, we recorded both operating lease right-of-use ("ROU") assets of $2,602,000 and operating lease liabilities of $2,622,000. The cumulative-effect adjustment to our beginning accumulated deficit upon adoption of ASU 2016-02 was considered immaterial. The adoption of Topic 842 had an immaterial impact on our Consolidated Statements of Operations and Cash Flows for the nine months ended September 30, 2019.

Known Trends and Uncertainties

Significant Customers. Our Treatment and Services Segments have significant relationships with the U.S and Canadian governmental authorities, and continue to enter into contracts, directly as the prime contractor or indirectly for others as a subcontractor, with the government authorities. The U.S Department of Energy ("DOE") and U.S. Department of Defense ("DOD") represent major customers for our Treatment Segment and Services Segments. The contracts that we are a party to with the U.S federal government or with others as a subcontractor to the U.S federal government generally provide that the government may terminate or renegotiate the contracts on 30 days' notice, at the government's election. The contracts/task order agreements that we are a party to with Canadian governmental authorities generally provide that the government authorities may terminate the contracts/task order agreements at any time for any reason for convenience. Our inability to continue under existing contracts that we have with the U.S federal government and Canadian government authorities (directly or indirectly as a subcontractor) or significant reductions in the level of governmental funding in any given year could have a material adverse impact on our operations and financial condition.

We performed services relating to waste generated by government clients (domestic and foreign (primarily Canadian)), either directly as a prime contractor or indirectly for others as a subcontractor to government entities, representing approximately $19,496,000 or 86.5% and $41,354,000 or 80.5% of our total revenues generated during the three and nine months ended September 30, 2019, respectively, as compared to $8,808,000 or 73.5% and $28,075,000 or 74.3% of our total revenues generated during the three and nine months ended September 30, 2018.

Environmental Contingencies

We are engaged in the waste management services segment of the pollution control industry. As a participant in the on-site treatment, storage and disposal market and the off-site treatment and services market, we are subject to rigorous federal, state and local regulations. These regulations mandate strict compliance and therefore are a cost and concern to us. Because of their integral role in providing quality environmental services, we make every reasonable attempt to maintain complete compliance with these regulations; however, even with a diligent commitment, we, along with many of our competitors, may be required to pay fines for violations or investigate and potentially remediate our waste management facilities.

We routinely use third party disposal companies, who ultimately destroy or secure landfill residual materials generated at our facilities or at a client's site. In the past, numerous third party disposal sites have improperly managed waste and consequently require remedial action; consequently, any party utilizing these sites may be liable for some or all of the remedial costs. Despite our aggressive compliance and auditing procedures for disposal of wastes, we could further be notified, in the future, that we are a potentially responsible party ("PRP") at a remedial action site, which could have a material adverse effect.

Our subsidiaries where remediation expenditures will be made are at three sites within our discontinued operations. While no assurances can be made that we will be able to do so, we expect to fund the expenses to remediate these sites from funds generated from operations.

At September 30, 2019, we had total accrued environmental remediation liabilities of $877,000, of which $418,000 is recorded as a current liability, which reflects a decrease of $10,000 from the December 31, 2018 balance of $887,000. The decrease of $10,000 represents payments on remediation projects at our Perma-Fix of Dayton, Inc. subsidiary.

Item 3. Quantitative and Qualitative Disclosures about Market Risks

Not applicable

Item 4. Controls and Procedures

(a) *Evaluation of disclosure controls and procedures.*

We maintain disclosure controls and procedures that are designed to ensure that information required to be disclosed in our periodic reports filed with the Securities and Exchange Commission is recorded, processed, summarized and reported within the time periods specified in the rules and forms of the Securities and Exchange Commission and that such information is accumulated and communicated to our management. As of the end of the period covered by this report, we carried out an evaluation with the participation of our Principal Executive Officer and Principal Financial Officer. Based on this recent assessment, our Principal Executive Officer and Principal Financial Officer have concluded that our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) of the Securities Exchange Act of 1934, as amended) were effective as of September 30, 2019

(b) *Changes in internal control over financial reporting.*

Effective January 1, 2019, we adopted ASU No. 2016-02, "Leases (Topic 842)" and ASU 2018-11, "Targeted Improvements" (collectively referred to as "Topic 842"). Although the adoption of Topic 842 did not have a material impact to our Consolidated Statements of Operations and Cash Flows for the nine months ended September 30, 2019, we implemented changes to our internal controls related to the lease accounting standards. These changes included performing a comprehensive lease scoping analysis to identify and evaluate each of our lease categories and implementing procedures to calculate ROU assets and lease liabilities values for our leases. There was no other change in our internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act) during our most recently completed fiscal quarter that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

PART II – OTHER INFORMATION

Item 1. Legal Proceedings

There are no additional material legal proceedings pending against us and/or our subsidiaries not previously reported by us in Item 3 of our Form 10-K for the year ended December 31, 2018, which is incorporated herein by reference.

Item 1A. Risk Factors

There has been no other material change from the risk factors previously disclosed in our Form 10-K for the year ended December 31, 2018 and Form 10-Q for the three months ended March 31, 2019.

Item 6. Exhibits

(a) **Exhibits**

4.1	Eleventh Amendment to Amended and Restated Revolving Credit, Term Loan and Security Agreement and Waiver between PNC Bank, National Association and Perma-Fix Environmental Services, Inc., dated March 29, 2019, as incorporated by reference from Exhibit 4.14 to the Company's 2018 Form 10-K filed on April 1, 2019.
4.2	Twelfth Amendment to Amended and Restated Revolving Credit, Term Loan and Security Agreement between PNC Bank, National Association and Perma-Fix Environmental Services, Inc., dated June 20, 2019, as incorporated by reference from Exhibit 4.1 to the Company's Form 8-K filed on June 21, 2019.
31.1	Certification by Mark Duff, Chief Executive Officer of the Company pursuant to Rule 13a-14(a) or 15d-14(a).
31.2	Certification by Ben Naccarato, Chief Financial Officer of the Company pursuant to Rule 13a-14(a) or 15d-14(a).
32.1	Certification by Mark Duff, Chief Executive Officer of the Company furnished pursuant to 18 U.S.C. Section 1350.
32.2	Certification by Ben Naccarato, Chief Financial Officer of the Company furnished pursuant to 18 U.S.C. Section 1350.
101.INS	XBRL Instance Document*
101.SCH	XBRL Taxonomy Extension Schema Document*
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document*
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document*
101.LAB	XBRL Taxonomy Extension Labels Linkbase Document*
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document*

* Pursuant to Rule 406T of Regulation S-T, the Interactive Data File in Exhibit 101 hereto are deemed not filed or part of a registration statement or prospectus for purposes of Section 11 or 12 of the Securities Act of 1933, as amended, are deemed not filed for purpose of Section 18 of the Securities Exchange Act of 1934, as amended, and otherwise are not subject to liability under those sections.

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the Registrant has duly caused this report to be signed on its behalf by the undersigned, hereunto duly authorized.

PERMA-FIX ENVIRONMENTAL SERVICES

Date: November 7, 2019	By: */s/ Mark Duff* Mark Duff President and Chief (Principal) Executive Officer
Date: November 7 , 2019	By: */s/ Ben Naccarato* Ben Naccarato Chief (Principal) Financial Officer

EXHIBIT 31.1

CERTIFICATIONS

I, Mark Duff, certify that:

1. I have reviewed this quarterly report on Form 10-Q of Perma-Fix Environmental Services, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of the internal control over financial reporting, to the registrant's auditors and the audit committee of registrant's board of directors (or persons performing the equivalent functions):

   a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: November 7, 2019

/s/ Mark Duff

Mark Duff
President and Chief Executive Officer

EXHIBIT 31.2

CERTIFICATIONS

I, Ben Naccarato, certify that:

1. I have reviewed this quarterly report on Form 10-Q of Perma-Fix Environmental Services, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of the internal control over financial reporting, to the registrant's auditors and the audit committee of registrant's board of directors (or persons performing the equivalent functions):

   a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: November 7, 2019

/s/ Ben Naccarato

Ben Naccarato
Vice President and Chief Financial Officer

EXHIBIT 32.1

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO SECTION 906
OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Quarterly Report of Perma-Fix Environmental Services, Inc. (“PESI”) on Form 10-Q for the quarter ended September 30, 2019, as filed with the Securities and Exchange Commission on the date hereof (the “Form 10-Q”), I, Mark Duff, President and Chief Executive Officer of the Company, certify, pursuant to 18 U.S.C. §1350, as adopted pursuant to §906 of the Sarbanes-Oxley Act of 2002, that:

(1) The Form 10-Q fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934 (15 U.S.C. §78m or §78o(d)); and

(2) The information contained in the Form 10-Q fairly presents, in all material respects, the financial condition and results of operations of the Company.

Dated: November 7, 2019

/s/ Mark Duff
Mark Duff
President and Chief Executive Officer

This certification is furnished to the Securities and Exchange Commission solely for purpose of 18 U.S.C. §1350 subject to the knowledge standard contained therein, and not for any other purpose.

EXHIBIT 32.2

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO SECTION 906
OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report of Perma-Fix Environmental Services, Inc. (“PESI”) on Form 10-Q for the quarter ended September 30, 2019, as filed with the Securities and Exchange Commission on the date hereof (the “Form 10-Q”), I, Ben Naccarato, Vice President and Chief Financial Officer of the Company, certify, pursuant to 18 U.S.C. §1350, as adopted pursuant to §906 of the Sarbanes-Oxley Act of 2002, that:

(1) The Form 10-Q fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934 (15 U.S.C. §78m or §78o(d)); and

(2) The information contained in the Form 10-Q fairly presents, in all material respects, the financial condition and results of operations of the Company.

Dated: November 7, 2019

/s/ Ben Naccarato

Ben Naccarato
Vice President and Chief Financial Officer

This certification is furnished to the Securities and Exchange Commission solely for purpose of 18 U.S.C. §1350 subject to the knowledge standard contained therein, and not for any other purpose.