ERM NC, Inc.

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January 15, 2016

Ms. Dianne Thomas
Inactive Hazardous Sites Branch - REC Program
NCDEQ - Division of Waste Management
217 West Jones Street
Raleigh, North Carolina 27603
Phone: (919) 707-8348
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http://portal.ncdenr.org/web/wm/sf/ihs/recprogram

Subject: 4th Quarter 2015 Progress Update
Engineered Controls International, LLC (ECI)
100 Rego Drive
Elon, Alamance County, North Carolina
Docket No. 13-SF-367
NONCD0002904

Dear Ms. Thomas:

On behalf of ECI, ERM NC, Inc. (ERM) has prepared this quarterly status update of activities for the 4th quarter of 2015 at the ECI – Elon, North Carolina site. During the reporting period, ERM completed the following activities:

- Evaluated site groundwater data collected in July 2015 (Tables 1 through Table 3).
- Conducted a subcontractor bid walk and received bids in anticipation of installation of a remedial system in accordance with the approved RAP.
- Following the passing of House Bill 765, ERM prepared a *Draft Risk Based Closure Decision Analysis Tool* for the RP to make an informed decision of the potential path forward.

Progress is proceeding in a manner to achieve the mandatory work phase completion deadlines set out in 15A NCAC 13C .0302(h). Certification statements for the Remediating Party and RSM are attached.

If you have any questions regarding this project, please contact me at 704-541-8345.

Sincerely,

Edward B. Hollifield, P.G.
Project Manager

Cc: Tom Wilson, P.G. RSM
Jimmy McCandies – Engineered Controls International, LLC
Peter McGrath – Moore & Van Allen, PLLC
Sarah Broughel – Choate, Hall & Stewart, LLP

TABLE 1. MONITOR WELL CONSTRUCTION AND GROUNDWATER ELEVATION SUMMARY - ECI ELON FACILITY - ELON, NORTH CAROLINA

Well ID	Installation Date	Drilling Method	Well Type	Diameter/ Material/ Casing	Monitored Aquifer Zone	Surface Casing Depth (ft bls)	Total Depth (ft bls)	Screen Interval (ft bls)	Land Surface Elevation (ft msl)	Measuring Point Elevation TOC (ft msl)	Elevation Top of Screen (ft msl)	Elevation Bottom of Screen (ft msl)	Depth to Water (bmp)	Groundwater Elevation
													July 2015	
Deep Wells														
DW-1	11/5-7/2012	HSA/Air Rotary	III	2-in PVC	Upper Bedrock	65	85	75 - 85	707.93	707.68	632.93	622.93	37.29	670.39
DW-2	2/14-20/2013	HSA/Air Rotary	III	2-in PVC	Intermediate Bedrock	100	131	101 - 131	705.31	705.06	604.31	574.31	60.64	644.42
DW-2D	10/6-7-2014	HSA/Air Rotary	III	2-in PVC	Lower Bedrock	150	227	217 - 227	705.19	704.94	488.19	478.19	63.74	641.20
DW-3	5/12-14/2014	HSA/Air Rotary	III	2-in PVC	Upper Bedrock	59	80	70 - 80	685.40	688.23	615.4	605.4	21.99	666.24
DW-4	5/14-16-2014	HSA/Air Rotary	III	2-in PVC	Upper Bedrock	60	85	74 - 84	695.75	695.40	621.75	611.75	41.49	653.91
DW-5	5/15-19/2014	HSA/Air Rotary	III	2-in PVC	Upper Bedrock	68	83	73 - 83	711.74	711.38	638.74	628.74	26.95	684.43
DW-6	1/12-19/2015	HSA/Air Rotary	III	2-in PVC	Upper Bedrock	63	85	75 - 85	693.57	693.26	618.57	608.57	50.64	642.62
DW-6D	1/12-19/2015	HSA/Air Rotary	III	2-in PVC	Intermediate Bedrock	100	140	120 - 140	693.43	693.30	573.43	553.43	51.90	641.40
Monitor Wells														
GP-2	7/20/2011	Direct Push	II	1-in PVC	Saprolite	--	45	35 - 45	712.52	712.35	677.52	667.52	NM	NM
MW-1	7/19/2011	Direct Push	II	2-in PVC	Saprolite	--	40	25 - 35	695.42	695.17	670.42	660.42	29.13	666.04
MW-2	7/19/2011	Direct Push	II	2-in PVC	Saprolite	--	35	25 - 35	703.33	703.08	678.33	668.33	30.89	672.19
MW-3	7/19/2011	Direct Push	II	2-in PVC	Saprolite	--	35	25 - 35	709.34	709.09	684.34	674.34	32.38	676.71
MW-4	7/19/2011	Direct Push	II	2-in PVC	Saprolite	--	40	28 - 38	711.79	711.54	683.79	673.79	27.62	683.92
MW-5	7/19/2011	Direct Push	II	2-in PVC	Saprolite	--	35	22 - 32	708.93	708.68	686.93	676.93	25.57	683.11
MW-6	7/19/2011	Direct Push	II	2-in PVC	Saprolite	--	35	25 - 35	707.28	707.03	682.28	672.28	33.24	673.79
MW-7	7/19/2011	Direct Push	II	2-in PVC	Saprolite	--	40	30 - 40	708.29	708.04	678.29	668.29	37.05	670.99
MW-8	11/6/2012	Direct Push	II	2-in PVC	Saprolite	--	40	30 - 40	707.49	707.24	677.49	667.49	36.68	670.56
MW-9	11/6/2012	Direct Push	II	2-in PVC	Saprolite	--	39	29 - 39	705.22	704.97	676.22	666.22	35.68	669.29
MW-10	11/6/2012	Direct Push	II	2-in PVC	Saprolite	--	40	30 - 40	708.79	708.54	678.79	668.79	32.75	675.79
MW-11	11/6/2012	Direct Push	II	2-in PVC	Saprolite	--	40	30 - 40	704.05	703.80	674.05	664.05	34.60	669.20
MW-12	11/5/2012	Direct Push	II	2-in PVC	Saprolite	--	40	30 - 40	701.05	700.80	671.05	661.05	29.06	671.74
MW-13	11/6/2012	Direct Push	II	2-in PVC	Saprolite	--	30	20 - 30	706.91	706.66	686.91	676.91	26.63	680.03
MW-14	2/11/2013	Direct Push	II	2-in PVC	Saprolite	--	30	20 - 30	687.41	690.81	667.41	657.41	22.85	667.96
MW-15	2/11/2013	Direct Push	II	2-in PVC	Saprolite	--	30	20 - 30	685.10	688.47	665.1	655.1	22.18	666.29
MW-16	2/11/2013	Direct Push	II	2-in PVC	Saprolite	--	30	20 - 30	684.91	688.24	664.91	654.91	22.69	665.55

Notes:
ft bls = feet below land surface
ft msl = feet above mean sea level
bmp = below monitor point

TABLE 2. HYDRAULIC GRADIENT SUMMARY - ECI ELON FACILITY - ELON, NORTH CAROLINA

Vertical Hydraulic Gradients

Well Designation	July 2015							
	Reference Elevation (ft ASL)	Depth to Water (ft)	Head Measurement Location Elevation (relative ft ASL)	Head Elevation (ft)	Head Change (ft)	Length Change (ft)	Hydraulic Gradient (ft/ft)	Up/ Down
MW-1	695.17	29.13	665.42	666.04	12.13	48.67	0.2492	Down
DW-4	695.40	41.49	616.75	653.91				
MW-4	711.54	27.62	678.79	683.92	-0.51	45.05	-0.0113	Up
DW-5	711.38	26.95	633.74	684.43				
MW-7	708.04	37.05	669.64	670.99	0.60	41.71	0.0144	Down
DW-1	707.68	37.29	627.93	670.39				
MW-9	704.97	35.68	667.76	669.29	24.87	78.45	0.3170	Down
DW-2	705.06	60.64	589.31	644.42				
MW-16	688.24	22.69	659.91	665.55	-0.69	49.51	-0.0139	Up
DW-3	688.23	21.99	610.40	666.24				
DW-6	693.26	50.64	613.57	642.62	1.22	50.14	0.0243	Down
DW-6D	693.30	51.90	563.43	641.40				

Notes:
(-) vertical gradient represents upward groundwater flow
(+) vertical gradient represents downward groundwater flow

Horizontal Hydraulic Gradient - Saprolite

Well Designation	July 2015					
	Reference Elevation (ft ASL)	Depth to Water (ft)	Head Elevation (ft)	Head Change (ft)	Distance Change (ft)	Hydraulic Gradient (ft/ft)
MW-4	711.54	27.62	683.92	12.93	290.93	0.0444
MW-7	708.04	37.05	670.99			
MW-7	708.04	37.05	670.99	5.44	450.84	0.0121
MW-16	688.24	22.69	665.55			
					Average Hydraulic Gradient	**0.0283**

Horizontal Hydraulic Gradient - Upper Bedrock

Well Designation	July 2015					
	Reference Elevation (ft ASL)	Depth to Water (ft)	Head Elevation (ft)	Head Change (ft)	Distance Change (ft)	Hydraulic Gradient (ft/ft)
DW-5	711.38	26.95	684.43	14.04	344.14	0.0408
DW-1	707.68	37.29	670.39			
DW-1	707.68	37.29	670.39	4.15	412.50	0.0101
DW-3	688.23	21.99	666.24			
					Average Hydraulic Gradient	**0.0254**

Seepage Velocity Calculation

Slug Test and Aquifer Test Analysis Summary			
Monitoring Well	Hydrostratigraphic Unit	Hydraulic Conductivity (cm/sec)	(ft/day)
MW-1	Shallow	1.52E-04	0.429
	Shallow	1.71E-04	0.484
MW-4	Shallow	2.02E-05	0.057
MW-7	Shallow	1.79E-05	0.051
	Shallow	1.21E-05	0.034
	Geometric Mean for Shallow:	**4.08E-05**	**0.116**
DW-3	Upper Bedrock	1.31E-04	0.372
	Upper Bedrock	5.62E-04	1.592
	Upper Bedrock	1.26E-04	0.358
DW-5	Upper Bedrock	4.68E-04	1.325
	Upper Bedrock	3.67E-04	1.040
	Geometric Mean for Upper Bedrock:	**2.76E-04**	**0.782**
DW-2	Intermediate Bedrock	3.09E-06	0.009
	Intermediate Bedrock	4.77E-06	0.014
	Geometric Mean for Lower Bedrock:	**3.84E-06**	**0.011**

Saprolite aquifer seepage velocity = Ki/n $_e$

where:
K is hydraulic conductivity (geometric mean for the primary flowpath)
i = horizontal hydraulic gradient (average of values presented above)
n_e = effective porosity

Estimated Effective Porosity Values

Shallow	0.35
Upper Bedrock	0.10
Lower Bedrock	0.10

Seepage Velocity (Saprolite) =
= (0.000041) (0.0283) / (0.35) = 3.29E-06 cm/sec
or 0.009 ft/day
or **3.41 ft/yr**

Seepage Velocity (Upper Bedrock) =
= (0.000276) (0.0254) / (0.1) = 7.02E-05 cm/sec
or 0.199 ft/day
or **72.58 ft/yr**

Seepage Velocity (Intermediate Bedrock) =
= (0.00000384) (0.0254) / (0.1) = 9.77E-07 cm/sec
* assumes same horizontal gradient as upper bedrock
or 0.003 ft/day
or **1.01 ft/yr**

TABLE 3. SUMMARY OF HISTORICAL GROUNDWATER RESULTS FOR VOCs, SVOCs & TPH - ECI ELON FACILITY - ELON, NORTH CAROLINA

Sample ID	Date	VOCs - Method 5035A/8260B (µg/L)												
		Total VOCs	Acetone	Bromodichloromethane	Carbon disulfide	Chloroform	cis-1,2-Dichloroethylene	Ethylbenzene	Methyl Tert Butyl Ether	Tetrachloroethylene	Toluene	Trichloroethylene	Xylene (total)	1,4-Dioxane
NC 2L Groundwater		**NE**	**6000**	**0.6**	**700**	**70**	**70**	**600**	**20**	**0.7**	**600**	**3**	**500**	**3**
DW-1	07/31/15	108.82	1.9 J	<1.0	NA	0.88 J	1	0.44 J	<1.0	**39**	<1.0	**64**	1.6	NA
DW-2	07/29/15	44.5	5 J	<1.0	NA	<1.0	1.5	<1.0	<1.0	**13**	<1.0	**25**	<1.0	NA
DW-2D	07/29/15	10.5	2 J	<1.0	NA	<1.0	<1.0	<1.0	<1.0	**7**	<1.0	1.5	<1.0	NA
DW-3	07/30/15	6.02	<20	<1.0	NA	<1.0	<1.0	0.22 J	<1.0	**4.4**	<1.0	<1.0	1.4	NA
DW-4	07/29/15	20.02	<20	<1.0	NA	<1.0	0.22 J	<1.0	<1.0	**3.8**	<1.0	**16**	<1.0	NA
DW-5	07/29/15	6.2	1.6 J	<1.0	NA	2.1	<1.0	<1.0	<1.0	**2.5**	<1.0	<1.0	<1.0	NA
DW-6	07/28/15	8.34	3.1 J	<1.0	NA	0.24 J	<1.0	<1.0	<1.0	**3.5**	<1.0	1.5	<1.0	NA
DW-6D	07/28/15	6.88	<20	<1.0	NA	<1.0	0.78 J	<1.0	<1.0	**2**	<1.0	**4.1**	<1.0	NA
MW-1	07/29/15	1.69	<20	<1.0	NA	<1.0	<1.0	<1.0	<1.0	**1.5**	<1.0	0.19 J	<1.0	NA
MW-2	07/29/15	1.68	<20	<1.0	NA	<1.0	<1.0	<1.0	<1.0	**1.5**	<1.0	0.18 J	<1.0	NA
MW-3	07/28/15	1.3	<20	<1.0	NA	<1.0	<1.0	<1.0	<1.0	**1.3**	<1.0	<1.0	<1.0	NA
MW-4	07/29/15	9.5	<20	<1.0	NA	8.4	<1.0	<1.0	<1.0	**1.1**	<1.0	<1.0	<1.0	NA
MW-5	07/30/15	0.35	<20	<1.0	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.35 J	<1.0	<3.0
MW-6	07/30/15	BDL	<20	<1.0	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NA
MW-7	07/31/15	2969	<1000	<50	NA	<50	59	<50	<50	**110**	<50	**2800**	<50	<3.0
MW-7 (DUP-01)	07/31/15	3304	<1000	<50	NA	12 J	62	<50	<50	**130**	<50	**3100**	<50	NA
MW-8	07/30/15	143.67	<20	<1.0	NA	0.41 J	1.5	0.56 J	<1.0	**1.2**	<1.0	**140**	<1.0	NA
MW-9	07/28/15	2590	<1000	<50	NA	<50	21 J	<50	<50	**69**	<50	**2500**	<50	<3.0
MW-10	07/31/15	6.1	2.4 J	<1.0	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**3.7**	<1.0	<3.0
MW-11	07/31/15	BDL	<20	<1.0	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NA
MW-12	07/31/15	4.45	<20	<1.0	NA	<1.0	<1.0	0.7 J	<1.0	<1.0	0.25 J	<1.0	3.5	NA
MW-13	07/30/15	BDL	<20	<1.0	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NA
MW-14	07/31/15	BDL	<20	<1.0	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NA
MW-15	07/31/15	BDL	<20	<1.0	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NA
MW-16	07/30/15	BDL	<20	<1.0	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NA

Notes:
Only detected compounds are listed. µg/L = micrograms per liter
Groundwater criteria are NC2L Standards
BDL: Below Laboratory Detection Limit; NA: Not Analyzed; NE: Not Established
VOCs: Volatile organic compounds; SVOCs: Semi-Volatile organic compounds; TPH: Total Petroleum Hydrocarbons
BOLD values exceed NC2L Standards

REC PROGRAM DOCUMENT CERTIFICATION FORM - PAGE 1 OF 2

IHSB SITE NAME Engineered Controls International - Elon (Docket No. 13-SF-367, NONCD0002904)

DATE & NAME OF DOCUMENT January 15, 2016 4th Quarter 2015 Progress Report

TYPE OF SUBMITTAL (circle all that apply): Report, Work plan, Work Phase Comp. Statement, Schedule Change

REMEDIATING PARTY DOCUMENT CERTIFICATION STATEMENT (.0306(B)(2))

"I certify under penalty of law that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, the material and information contained herein is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for willfully submitting false, inaccurate or incomplete information."

Mr. Jimmy McCandies
Name of Remediating Party

Jimmy McCandies
Signature of Remediating Party

1-11-15
Date

NOTARIZATION

PTH North Carolina
~~Alamance~~ (Enter State)

Alamance **COUNTY**

I, Patricia T. Hill, a Notary Public of said County and State, do hereby certify that Jimmy McCandies did personally appear and sign before me this day, produced proper identification in the form of personally known, was duly sworn or affirmed, and declared that, to the best of his or her knowledge and belief, after thorough investigation, the information contained in the above certification is true and accurate, and he or she then signed this Certification in my presence.

WITNESS my hand and official seal this 11 day of January, 2016.

Patricia T. Hill
Notary Public (signature)

(OFFICIAL SEAL)

My commission expires: 2-7-17.

OFFICIAL SEAL
PATRICIA T. HILL
Notary Public - North Carolina
ALAMANCE COUNTY
My Commission Expires

Patricia T. Hill

Document Certification Form No. DC - I
(Revised 8/11)

REC PROGRAM DOCUMENT CERTIFICATION FORM - PAGE 2 OF 2
IHSB SITE NAME Engineered Controls International - Elon (Docket No. 13-SF-367, NONCD0002904)
DATE & NAME OF DOCUMENT January 15, 2016 4th Quarter 2015 Progress Report
TYPE OF SUBMITTAL (circle all that apply) Report, Work plan, Work Phase Comp. Statement, Schedule Change

REGISTERED SITE MANAGER CERTIFICATION OF SIGNATURES

As the Registered Environmental Consultant for the Site for which this filing is made, I certify that the signatures included herewith are genuine and authentic original handwritten signatures and/or true, accurate, and complete copies of the genuine and authentic original handwritten signatures of the persons who purport to sign for this filing. I further certify that I have collected through reliable means the originals and/or copies of said signatures from the persons authorized to sign for this filing who, in fact, signed the originals thereof. Those persons and I understand and agree that any copies of signatures have the same legally binding effect as original handwritten signatures, and I certify that any person for whom I am submitting a copy of their signature has provided me with their express consent to submit said copy. Additionally, I certify that I am authorized to attest to the genuineness and authenticity of the signatures, both originals and any copies, being submitted herewith and that by signing below, I do in fact attest to the genuineness and authenticity of all the signatures, both originals and copies, being submitted for this filing.

Tom Wilson, PG, RSM
Name of Registered Site Manager

Thomas M Wilson
Signature of Registered Site Manager

1-15-2016
Date

REGISTERED SITE MANAGER DOCUMENT CERTIFICATION STATEMENT (.0306(b)(1))

"I certify under penalty of law that I am personally familiar with the information contained in this submittal, including any and all supporting documents accompanying this certification, and that the material and information contained herein is, to the best of my knowledge and belief, true, accurate and complete and complies with the Inactive Hazardous Sites Response Act N.C.G.S. 130A-310, et seq, and the remedial action program Rules 15A NCAC 13C .0300. I am aware that there are significant penalties for willfully submitting false, inaccurate or incomplete information."

Thomas M Wilson
Name of Registered Site Manager

Thomas M Wilson
Signature of Registered Site Manager

1-15-2016
Date

NOTARIZATION

North Carolina (Enter State)

Mecklenburg COUNTY

I, Debra C Pressley, a Notary Public of said County and State, do hereby certify that Thomas M Wilson did personally appear and sign before me this day, produced proper identification in the form of NCDL, was duly sworn or affirmed, and declared that, he or she is the duly authorized environmental consultant of the remediating party of the property referenced above and that, to the best of his or her knowledge and belief, after thorough investigation, the information contained in the above certifications is true and accurate, and he or she then signed these Certifications in my presence.

WITNESS my hand and official seal this 15 day of January, 2016

Debra C Pressley
Notary Public (signature)

(OFFICIAL SEAL)

My commission expires: 10/27/2017

DEBRA C PRESSLEY
Notary Public
North Carolina
Union County

Document Certification Form No. DC - II
(Revised 8/11)