BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF: PETITION OF CATERPILLAR INC. FOR AN ADJUSTED STANDARD FROM 35 ILL. ADMIN. CODE 620.410(a) AND 817.106(a)	AS 13 - 5 (Adjusted Standard)

NOTICE OF FILING

To:

Office of the Clerk
Illinois Pollution Control Board
James R. Thompson Center
100 West Randolph Street
Suite 11-500
Chicago, Illinois 60601-3218

Division of Legal Counsel
Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276

PLEASE TAKE NOTICE that we have today filed electronically with the Office of the Clerk of the Pollution Control Board, the following documents on behalf of Caterpillar Inc.:

1. Response to the Hearing Officer's Order filed on August 8, 2013
2. Response to the Agency's Recommendation filed on August 9, 2013

Caterpillar Inc.

By:_____
Its Attorneys, Baker & McKenzie LLP

Dated: August 22, 2013

John W. Watson
Daniel R. De Deo
Baker & McKenzie LLP
300 East Randolph Street
Suite 5000
Chicago, Illinois 60601
312-861-2646

CERTIFICATE OF SERVICE

I, the undersigned, certify that I have served the attached Notice of Filing of Caterpillar Inc. for a Petition for an Adjusted Standard from 35 Ill. Admin. Code 620.410(a) and 817.106(a), upon the following persons on the 22nd day of August, 2013:

Division of Legal Counsel
Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276

Illinois Pollution Control Board, Attn: Clerk
James R. Thompson Center
1000 West Randolph Street
Suite 11-500
Chicago, Illinois 60601

Baker & McKenzie LLP

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BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF: PETITION OF CATERPILLAR INC. FOR AN ADJUSTED STANDARD FROM 35 ILL. ADM. CODE 620.410(a) AND 817.106(a)	AS 13 - 5 (Adjusted Standard)

RESPONSE TO HEARING OFFICER'S ORDER

In support of its Petition for an Adjusted Standard in the above-captioned matter, dated June 27, 2013, ("Petition"), Caterpillar Inc. ("Caterpillar"), by its attorneys, Baker & McKenzie LLP, hereby responds to the Illinois Pollution Control Board (the "Board") Hearing Officer's Order, dated August, 8, 2013.

Caterpillar appreciates the opportunity to provide the Board with additional information regarding the legal and technical basis for the requested adjusted standard in response to the Board's thorough review of the Company's Petition. As noted by the Illinois Environmental Protection Agency ("Agency") in its formal Recommendation to Petition for Adjusted Standard, dated August 9, 2013, ("Recommendation") in support of the Petition, Caterpillar and the Agency have engaged in an extensive and productive dialogue on the need for and appropriateness of the requested relief. This dialogue has included discussions among Caterpillar and the Agency and the submittal of supplemental technical information by Caterpillar in response to Agency questions. As a result of this productive exchange, the Agency has issued its Recommendation in full support of Caterpillar's Petition, recommending that the Board grant the requested adjusted standard for TDS as applied to leachate at Caterpillar's Mapleton Landfill.

In response to the Hearing Officer's review of the Petition and the limited additional questions raised by the Board in the August 8th Order (many of which were the subject of prior discussions between Caterpillar and the Agency), Caterpillar offers the following responses:

Questions 1 and 2: Questions 1 and 2 in the Board's August 8th Order seek clarification and additional information and background documentation with respect to the methodologies used to establish background threshold values and the results of site specific modeling through U.S. EPA's Pro UCL software. Caterpillar's consultant, Conestoga-Rovers & Associates, which performed the technical review and modeling work in support of the Petition, has reviewed the Board's additional questions and has prepared the attached Response to Comments to Illinois Pollution Control Board Order, dated August 19, 2013, (CRA "Response"). The CRA Response (Exhibit A) addresses both Questions 1 and 2 in the Board's August 8th Order.

Question 3: Caterpillar understands that the Agency is fully supportive of the Petition, including the proposal in the Petition to record an Environmental Land Use Control ("ELUC") limiting groundwater use at the Mapleton Landfill. A draft ELUC consistent with the Agency's prescribed form of such a covenant is attached as Exhibit B. We have forwarded a draft of the ELUC to the Agency for their review and approval. Note that we have also attached an approximate map of the area to be covered by the ELUC. Upon finalization of the language in the ELUC, Caterpillar will provide a more precise legal description of the landfill area.

Question 4: At this time, Caterpillar is not seeking relief from the maximum allowable leaching concentration for any constituents other than TDS.

Dated: August 22, 2013

Baker & McKenzie LLP

John W. Watson
Daniel R. De Deo
Baker & McKenzie LLP
300 East Randolph Street
Suite 5000
Chicago, Illinois 60601
312-861-2646

CERTIFICATE OF SERVICE

I, the undersigned, certify that I have served the attached Response of Caterpillar Inc. for its Petition for an Adjusted Standard from 35 Ill. Admin. Code 620.410(a) and 817.106(a), upon the following persons on the 22nd day of August, 2013:

Division of Legal Counsel
Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276

Illinois Pollution Control Board, Attn: Clerk
James R. Thompson Center
1000 West Randolph Street
Suite 11-500
Chicago, Illinois 60601

Baker & McKenzie LLP

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CONESTOGA-ROVERS & ASSOCIATES

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Telephone: (317) 291-7007 Fax: (317) 328-2666
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MEMORANDUM

TO:	Jaron Bromm, Caterpillar Inc. John Watson, Baker McKenzie, LLP	REF. NO.:	070102-04
FROM:	Steven Wanner, CRA/016	DATE:	August 21, 2013
C.C.:	Wesley Dyck, CRA		
RE:	**Response to Comments to Illinois Pollution Control Board Order Caterpillar Inc. Mapleton Part 817 Landfill Mapleton, Illinois**		

This memorandum provides Conestoga-Rovers & Associates' (CRA's) responses to the Illinois Pollution Control Board (IPCB) Order dated August 8, 2013 regarding the Caterpillar Inc. (Caterpillar) Petition for an Adjusted Standard dated June 27, 2013 (Petition). This memorandum provides responses to the IPCB's questions in Item Nos. 1 and 2 in the August 8th Order. The IPCB's questions are reiterated below in bold text followed by CRA's responses.

817.416(e) STATISTICAL ANALYSIS OF GROUNDWATER MONITORING DATA

1. IPCB Comments

Section 5.0 of Exh. 2 provides information on the statistical methods used. Additionally, Table 6.2 of Exh. 2 indicates the methods used from USEPA's ProUCL statistical software to calculate the Background Threshold Values (BTV). Table 6.2 indicates the BTV for Total Dissolved Solids (TDS) of 2539 mg/L is the Upper Tolerance Limit (UTL) based on normal approximation to the gamma distribution (Wilson-Hilferty – WH approximation). Exh. 2, Table 6.2.

(a) 35 Ill. Adm. Code 817.416(e) has some specific requirements for statistical analysis of groundwater monitoring data. Please elaborate on the information provided in Exh. 2 regarding the statistical analysis of the TDS groundwater monitoring data, specifically addressing whether the statistical analysis provided meets the requirements of 817.416(e).

Response

The compliance of the statistical analysis provided to the requirements of In 35 Ill. Adm. Code 817.416(e) is demonstrated by the following points:

- Normal theory statistical tests have been applied in the statistical analysis using a suitable transformation of the data (gamma distribution methods) [Ill. Adm. Code 817.416(e)(1)].
- The statistical test selected for establishing the BTV (tolerance intervals, and specifically the UTL), is one of the tests listed in the regulation [Ill. Adm. Code 817.416(e)(4)(C), as required under Ill. Adm. Code 817.416(e)(1).

- The level of significance (Type 1 error level) selected (0.01, for 99 percent confidence) is equal to the minimum for individual well comparisons specified in Ill. Adm. Code 817.416(e)1. The use of this level of significance for individual wells corresponds to a multiple-well level of significance greater than 0.05 (the minimum value under Ill. Adm. Code 817.416(e)(1)), since there are more than 5 site monitoring wells and leachate wells to be assessed.
- The level of significance used (0.01) was presented to the Agency (IEPA) and accepted in their calculations to verify the BTV presented in the Petition [Ill. Adm. Code 724.197(i)(4), as required under 817.416(e)(4)(C)]
- The basis of assessment of monitoring results from samples collected at site monitoring and leachate wells is a comparison, on a constituent-by-constituent basis (in this case TDS) against background conditions [Ill. Adm. Code 817.416(e)1(A)]. The calculated BTV may also be used to assess future monitoring results from background wells for changes over time [Ill. Adm. Code 817.416(e)(1)(B)].
- The applicable sampling and collection protocol requirements under Ill. Adm. Code 817.414 and 415 have been met for the samples used to generate the BTV [Ill. Adm. Code 817.416(e)(2)] as summarized in the Hydrogeological Investigation Report and demonstrated by IEPA's review and recommendation to the Board that the adjusted standard be granted (see IEPA's Recommendation to Petition for an Adjusted Standard dated August 9, 2013).
- TDS was present at detectable concentrations in all samples used for the BTV calculations, so no statistical accommodation of non-detect (ND) data was required [Ill. Adm. Code 817.416(e)(3)].
- Due to the statistical characteristics observed for the background data set, and the method selection process described in the bullet points above, Ill. Adm. Code 817.416(e)(4)(A and B), 416(e)(5) and 416(e)(6) did not apply and/or were not required in the assessment.

(b) The ProUCL Version 4.1.00 Technical Guide (ProUCL Technical Guide), referenced in Exh.2 at 33, states

> ***Positively skewed environmental data can often be modeled by a gamma distribution. ProUCL software has two goodness-of-fit tests (Anderson-Darling test and Kolmogorov-Smirnov test) to test for gamma distribution. UTL obtained using normal approximation to the gamma distribution (Krishnamoorthy et. al., 2008) has been incorporated in ProUCL 4.00.05. Those approximations are based upon Wilson-Hilferty – WH (1931) and Hawkins-Wixley – HW (1986) approximations. ProUCL Technical Guide at 86.***

(1) Please indicate how the TDS data was determined to have a gamma distribution.

(2) Please provide a printout from ProUCL of the input and output for the goodness-of-fit test(s) used to test the TDS data for gamma distribution.

Response

The ProUCL software used provides the capability to test a data set for normal, gamma, and log distributions during BTV calculations. The software prioritizes the distributions in the stated order (normal > gamma > log). In ProUCL's tests, the TDS background data set was found not to be normally distributed at a 5 percent significance level (using the Shapiro-Wilk test), but was found to

follow an approximate gamma distribution (using the Anderson-Darling and Kolmogorov-Smirnov tests). Therefore, ProUCL determined that the data have a gamma distribution (refer to the printout provided in the output reference below).

The ProUCL input data file is provided as Attachment A.

The ProUCL output file for the BTV calculation, which includes the goodness-of-fit tests, is provided as Attachment B.

(c) According to Exh. 2, the TDS BTV represents the statistical upper tolerance limits (UTL) calculated as the 95th percentile of background using a 99 percent confidence level. Exh. 2 at 30. Section 817.416(e)(6) allows, "Any other statistical test based on the distribution of the sampling data may be used, if it is demonstrated to meet the requirements of 35 Ill. Adm. Code 724.197(i)." Section 724.197(i)(4) requires

> ***If a tolerance interval or a prediction interval is used to evaluate groundwater monitoring data, the levels of confidence and, for tolerance intervals, the percentage of the population that the interval must contain, must be proposed by the owner or operator and approved by the Agency if the Agency finds these parameters to adequately protect human health and the environment.***

Does the Agency approve of the 99 percent confidence level and 95th percentile population that was used in Exh. 2 to arrive at the BTV for TDS of 2539 mg/L?

Response

Caterpillar submitted the Hydrogeological Investigation Report to the IEPA for review and comment prior to filing the Petition with the Board. Caterpillar responded to comments and questions posed by the IEPA, including comments and clarifications on the statistical methods and conclusions. It is Caterpillar's understanding that the IEPA utilized its own statistical evaluation software package to reproduce the proposed adjusted standard for TDS. Additionally, Caterpillar's consultant, CRA, provided the output from the ProUCL software for the IEPA's review.

Given the discussion above and IEPA's recommendation to the Board that the adjusted standard be granted (see IEPA's Recommendation to Petition for an Adjusted Standard dated August 9, 2013), Caterpillar understands that the IEPA thoroughly reviewed and approved all aspects of the Petition, including the statistical evaluation in the Hydrogeological Investigation Report attached to the Petition.

(d) The ProUCL Technical Guide states,

> ***ProUCL version 4.1 has a couple of simple outlier test procedures, such as the Dixon test and the Rosner test. ProUCL Technical Guide at vi.***

(1) Please indicate if the TDS data used to calculate the BTV for TDS was analyzed to determine if any of the data points, particularly the 3050 mg/l TDS value (Monitoring Well G113D, 4-7-2011), should be considered outliers.

(2) If so, please provide a copy of the data sheets form the ProUCL runs showing input and output values. Please also indicate if any outliers were identified and if they were used in the calculation of the BTV for TDS.

Response

Based on a thorough review of the results generated during the four quarters of TDS sampling, CRA did not complete a statistical outlier test to evaluate the background TDS data set. The 3050 mg/L result referenced above was obtained from the groundwater sample collected from monitoring well G113D in April 2011. CRA considered the representativeness of the April 2011 G113D result and completed a quality assessment and validation for all of the April 2011 analytical data consistent with the applicable U.S. Environmental Protection Agency (U.S. EPA) guidance documents. The data quality assessment and validation found the data to exhibit acceptable levels of accuracy and precision as summarized in the attached data validation memorandum (Attachment C). The data quality assessment and validation did not identify any concerns regarding the 3050 mg/L TDS concentration. Given that the location of the well is upgradient of the permitted landfill and other site activities, CRA retained this value in the background data set.

2. IPCB Comments

Tables 6.1, 6.3 and 6.4 of Exh. 2 are the "Statistical Inter-Group Comparison Results". The tables list the P-values from the WRS/Mann-Whitney Test and the Quantile Test. Footnote 1 of the table states, "Quantile tests were performed manually…", and Exh. 2 states that the Quantile Test "was carried out using spreadsheet calculation…" Exh. 2 at 31-32.

(a) Please provide a copy of data sheets from the ProUCL runs for the WRS/Mann-Whitney Test showing the input and output values.

(a) Please provide a copy of the spreadsheet calculations for the Quantile Test showing the input and output values and equations used.

Response

The ProUCL input data files for TDS for the WRS/Mann-Whitney Tests are provided as Attachment D.

The ProUCL output sheets for TDS for the WRS/Mann-Whitney Tests are provided as Attachment E.

The spreadsheet calculations for the Quantile Tests of the TDS data are provided as Attachment F, along ProUCL output for two Quantile Tests run using the software (as noted in Tables 6.3 and 6.4). Note that the reviewer is referred to Section 3.3.2.1.2, Box 3-35, and Table A-19 of the following

USEPA document for directions and nomenclature used in carrying out the test (these are required to follow the spreadsheet calculations):

> *USEPA, February 2006. Data Quality Assessment: Statistical Methods for Practitioners (EPA QA/G-9S). Office of Environmental Information, United States Environmental Protection Agency, Washington D.C. EPA/240/B-06/003. [Available at http://www.epa.gov/QUALITY/qs-docs/g9s-final.pdf].*

ATTACHMENT A

PROUCL INPUT DATA FILE

ATTACHMENT A -- ProUCL INPUT FILE

Depth Group	Location Group	Location	Sample ID	Date	Total Dissolved Solids (mg/L)	TDS	D_TDS
Deep	Upgradient	G110D	GW-070102-040611-NH-013	06/04/2011 12:00 AM	1370b	1370	1
Deep	Upgradient	G110D	GW-092211-TP-002	22/09/2011 12:00 AM	1300	1300	1
Deep	Upgradient	G110D	G110D	29/11/2011 12:00 AM	1400	1400	1
Deep	Upgradient	G110D	G110D	10/01/2012 12:00 AM	1300	1300	1
Shallow	Upgradient	G110S	GW-070102-040711-NH-015	07/04/2011 12:00 AM	1000	1000	1
Shallow	Upgradient	G110S	GW-092211-TP-001	22/09/2011 12:00 AM	840	840	1
Shallow	Upgradient	G110S	G110S	29/11/2011 12:00 AM	830	830	1
Shallow	Upgradient	G110S	G110S-1/2	10/01/2012 12:00 AM	790/800	790	1
Deep	Upgradient	G112D	GW-070102-040711-NH-016	07/04/2011 12:00 AM	1580b	1580	1
Deep	Upgradient	G112D	GW-092211-TP-005	22/09/2011 12:00 AM	1500	1500	1
Deep	Upgradient	G112D	G112D	29/11/2011 12:00 AM	1500	1500	1
Deep	Upgradient	G112D	G112D	11/01/2012 12:00 AM	1500	1500	1
Shallow	Upgradient	G112S	GW-070102-040611-NH-012	06/04/2011 12:00 AM	1060	1060	1
Shallow	Upgradient	G112S	GW-092211-TP-004	22/09/2011 12:00 AM	1000	1000	1
Shallow	Upgradient	G112S	G112S	29/11/2011 12:00 AM	1000	1000	1
Shallow	Upgradient	G112S	G112S	11/01/2012 12:00 AM	950	950	1
Deep	Upgradient	G113D	GW-070102-040711-NH-017	07/04/2011 12:00 AM	3050b	3050	1
Deep	Upgradient	G113D	GW-092211-TP-006/007	22/09/2011 12:00 AM	870/920	870	1
Deep	Upgradient	G113D	G113D-2/1	29/11/2011 12:00 AM	1100/1000	1100	1
Deep	Upgradient	G113D	G113D	10/01/2012 12:00 AM	950	950	1
Shallow	Upgradient	G113S	GW-070102-040611-NH-014	06/04/2011 12:00 AM	805	805	1
Shallow	Upgradient	G113S	GW-092211-TP-003	22/09/2011 12:00 AM	750	750	1
Shallow	Upgradient	G113S	G113S	29/11/2011 12:00 AM	750	750	1
Shallow	Upgradient	G113S	G113S	10/01/2012 12:00 AM	780	780	1

Shading indicates values used for background value calculation.

ATTACHMENT B

PROUCL BTV CALCULATION OUTPUT FILE

General Background Statistics for Data Sets with Non-Detects

User Selected Options

From File	70102 Upgradient Well Chemistry Updated 2013-04 (4 quarters excluding May 2011 and field duplicates).wst
Full Precision	OFF
Confidence Coefficient	99%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	10000

TDS

General Statistics

Total Number of Observations	24	Number of Distinct Observations	17
Tolerance Factor	2.662		

Raw Statistics

Minimum	750
Maximum	3050
Second Largest	1580
First Quartile	837.5
Median	1000
Third Quartile	1378
Mean	1166
Geometric Mean	1098
SD	486.9
Coefficient of Variation	0.418
Skewness	2.657

Log-Transformed Statistics

Minimum	6.62
Maximum	8.023
Second Largest	7.365
First Quartile	6.73
Median	6.908
Third Quartile	7.228
Mean	7.001
SD	0.331

Background Statistics

Normal Distribution Test

Shapiro Wilk Test Statistic	0.722
Shapiro Wilk Critical Value	0.916

Data not Normal at 5% Significance Level

Lognormal Distribution Test

Shapiro Wilk Test Statistic	0.884
Shapiro Wilk Critical Value	0.916

Data not Lognormal at 5% Significance Level

Assuming Normal Distribution

99% UTL with 95% Coverage	2462
99% UPL (t)	2408
90% Percentile (z)	1790
95% Percentile (z)	1967
99% Percentile (z)	2298

Assuming Lognormal Distribution

99% UTL with 95% Coverage	2649
99% UPL (t)	2554
90% Percentile (z)	1678
95% Percentile (z)	1892
99% Percentile (z)	2371

Gamma Distribution Test

k star	7.469
Theta Star	156.1
MLE of Mean	1166
MLE of Standard Deviation	426.5
nu star	358.5

Data Distribution Test

Data Follow Appr. Gamma Distribution at 5% Significance Level

General Background Statistics for Data Sets with Non-Detects

User Selected Options

From File	70102 Upgradient Well Chemistry Updated 2013-04 (4 quarters excluding May 2011 and field duplicates).wst
Full Precision	OFF
Confidence Coefficient	99%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	10000

A-D Test Statistic	0.941
5% A-D Critical Value	0.745
K-S Test Statistic	0.167
5% K-S Critical Value	0.178

Data follow Appx. Gamma Distribution at 5% Significance Level

Assuming Gamma Distribution

90% Percentile	1735
95% Percentile	1944
99% Percentile	2379
99% WH Approx. Gamma UPL	2464
99% HW Approx. Gamma UPL	2481
99% WH Approx. Gamma UTL with 95% Coverage	2539
99% HW Approx. Gamma UTL with 95% Coverage	2561

Nonparametric Statistics

90% Percentile	1500
95% Percentile	1568
99% Percentile	2712
99% UTL with 95% Coverage	3050
99% Percentile Bootstrap UTL with 95% Coverage	3050
99% BCA Bootstrap UTL with 95% Coverage	3050
99% UPL	3050
99% Chebyshev UPL	6110
Upper Threshold Limit Based upon IQR	2188

ATTACHMENT C

APRIL 2011 DATA VALIDATION

CONESTOGA-ROVERS & ASSOCIATES

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www.CRAworld.com

MEMORANDUM

TO:	Steve Wanner	REF. NO.:	070102-03
FROM:	Michael Richardson/am/05	DATE:	May 2, 2011
RE:	**Data Quality Assessment and Validation Landfill Well Installation and Sampling – April 2011 Caterpillar – Mapleton 817 Landfill – Mapleton, Illinois**		

The following details a quality assessment and validation of the analytical data resulting from the April 5-7, 2011 collection of two (2) surface water, seventeen (17) groundwater, and four (4) quality control samples from the Caterpillar – Mapleton 817 Landfill in Mapleton, Illinois. The sample summary detailing sample identification, sample location, quality control samples, and analytical parameters is presented in Table 1. Sample analysis was completed by TestAmerica Laboratories, Inc. of North Canton, Ohio (TA-NC) in accordance with the methodologies presented in Table 2.

The quality control criteria used to assess the data were established by the methods. Application of quality assurance criteria was consistent with the following guidance documents:

i. "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review", EPA 540/R-99/008, October 1999

ii. "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Review", EPA 540/R-94-013, February 1994

These guidelines are collectively referred to as "NFGs" in this Memorandum.

Overall Assessment

The data were found to exhibit acceptable levels of accuracy and precision based on the provided information and may be used with the qualifications noted in this memorandum.

Sample Quantitation

Sample analyses, requiring laboratory dilutions due to matrix effects were flagged by the laboratory with a "G"; no further qualification was required. The "G" flag may be disregarded.

Sample Preservation and Holding Times

Sample holding time periods and preservation requirements are presented in Table 2.

The samples, as indicated by the sample collection, extraction and analysis dates on the chain-of-custody forms and analytical reports provided by TA-NC, were prepared and analyzed within the required holding time periods.

The samples were shipped and maintained in accordance with the samples preservation requirements.

Method Blank Samples

Method blank samples are prepared from a purified sample matrix and are processed concurrently with investigative samples to assess the presence and the magnitude of sample contamination introduced during sample analysis. Method blank samples are analyzed at a minimum frequency of one per analytical batch and target analytes should be non-detect.

The method blank samples were reported to be free from detectable levels of target analytes, indicating no laboratory-attributable contamination occurred.

Surrogate Compounds – Organic Analyses

Individual sample performance for organic analyses was monitored by assessing the results of surrogate compound percent recoveries. Surrogate percent recoveries are reviewed against the laboratory developed control limits provided in the analytical report.

The surrogate recovery acceptance criteria were met for all samples that could be evaluated.

Matrix Spike/Matrix Spike Duplicate Analyses

To assess the long term accuracy and precision of the analytical methods on various matrices, matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and the relative percent difference (RPD) of the concentrations were determined. The organic MS/MSD percent recovery and RPD control limits are established by the laboratory. The inorganic control limits are defined by the methods and the NFG, which require recoveries between 75 to 125 percent for metals and between 80 to 120 percent for general chemistry parameters with RPDs less than 20 percent for water samples. The samples selected for MS/MSD analysis are identified in Table 1.

In some sample batches, no Site-specific samples were utilized as MS/MSDs; precision and accuracy were verified by the analysis of the laboratory control sample/laboratory control sample duplicate (LCS/LCSD). Qualification of samples associated with these MS/MSDs was not performed. The MS/MSD percent recoveries for some parameters could not be measured due to insufficient spike concentration in relation to the sample concentration. No qualification was required.

The samples that should be qualified due to violation of MS/MSD percent recovery criteria are outlined in Table 3. The MS/MSD percent recoveries and associated RPD acceptance criteria were met in the remaining sample analyses.

Laboratory Control Sample/Laboratory Control Sample Duplicate Analysis

The laboratory control sample and laboratory control sample duplicate (LCS/LCSD) analyses serve as a monitor of the overall performance in all steps of the sample analysis and are analyzed with each sample

batch. The LCS/LCSD percent recoveries were evaluated against method and laboratory established control limits.

The LCS/LCSD percent recoveries were within the laboratory control limits or did not warrant qualification, indicating that an acceptable level of overall performance was achieved.

Laboratory precision was verified by the relative percent difference (RPD) of the LCS/LCSD when a matrix spike/matrix spike duplicate was not analyzed.

The RPDs were within the laboratory control limits, indicating that an acceptable level of overall laboratory precision was achieved.

Field Quality Assurance/Quality Control

The field quality assurance/quality control consisted of two (2) field duplicate sample sets and two (2) trip blank samples.

Field Duplicate Samples

Overall precision for the sampling event and laboratory procedures was monitored using the results of the field duplicate sample sets. The RPDs associated with these duplicate samples must be less than 50 percent for water samples. If the reported concentration in either the investigative sample or its duplicate is less than five times the RL, the evaluation criteria is one times the RL value for water samples.

The data indicate that an adequate level of precision was achieved for the sampling event.

Trip Blank Samples

To monitor potential cross-contamination of VOCs during aqueous sample transportation and storage, a trip blank was submitted to the laboratory for VOC analysis with each shipping cooler containing multiple samples.

No target analytes were reported as detected in the trip blank samples.

TABLE 1

SAMPLE COLLECTION AND ANALYSIS SUMMARY
LANDFILL WELL INSTALLATION AND SAMPLING - APRIL 2011
CATERPILLAR - MAPLETON 817 LANDFILL
MAPLETON, ILLINOIS

						Analysis/Parameters							
Sample Identification	*Location*	*Matrix*	*QC Samples*	*Collection Date (mm/dd/yyyy)*	*Collection Time (hr:min)*	*Select VOC*	*Select Metals*	*Chloride*	*Fluoride*	*Nitrate as Nitrogen*	*Sulfate*	*TDS*	*TTHM*
TA-NC Lot No.: 1D06583													
SW-070102-040511-NH-001	SG-01	Surface Water	-	4/5/2011	10:30							X	
SW-070102-040511-NH-002	SG-02	Surface Water	-	4/5/2011	11:30							X	
GW-070102-040511-NH-001	G-103S	Groundwater	MS/MSD	4/5/2011	14:40	X	X	X	X	X	X	X	X
GW-070102-040511-NH-002	G-104S	Groundwater	-	4/5/2011	14:35	X	X	X	X	X	X	X	X
GW-070102-040511-NH-003	G-103D	Groundwater	-	4/5/2011	16:30	X	X	X	X	X	X	X	X
GW-070102-040511-NH-004	G-104D	Groundwater	MS/MSD	4/5/2011	16:26	X	X	X	X	X	X	X	X
TB-070102-040511-NH-001	-	Water	Trip Blank	4/5/2011	17:30	X							X
GW-070102-040611-NH-005	G-106S	Groundwater	-	4/6/2011	8:40	X	X	X	X	X	X	X	X
GW-070102-040611-NH-006	G-105S	Groundwater	-	4/6/2011	8:52	X	X	X	X	X	X	X	X
GW-070102-040611-NH-007	G-102S	Groundwater	-	4/6/2011	10:10	X	X	X	X	X	X	X	X
GW-070102-040611-NH-008	G-102S	Groundwater	DUP (007)	4/6/2011	10:15	X	X	X	X	X	X	X	X
GW-070102-040611-NH-009	G-111D	Groundwater	MS/MSD	4/6/2011	10:19	X	X	X	X	X	X	X	X
GW-070102-040611-NH-010	G-111S	Groundwater	-	4/6/2011	11:04	X	X	X	X	X	X	X	X
GW-070102-040611-NH-011	G-108S	Groundwater	-	4/6/2011	11:45	X	X	X	X	X	X	X	X
GW-070102-040611-NH-012	G-112S	Groundwater	-	4/6/2011	13:52	X	X	X	X	X	X	X	X
GW-070102-040611-NH-013	G-110D	Groundwater	-	4/6/2011	15:30	X	X	X	X	X	X	X	X
GW-070102-040611-NH-014	G-113S	Groundwater	-	4/6/2011	15:41	X	X	X	X	X	X	X	X
GW-070102-040711-NH-015	G-110S	Groundwater	-	4/7/2011	8:25	X	X	X	X	X	X	X	X
GW-070102-040711-NH-016	G-112D	Groundwater	-	4/7/2011	7:58	X	X	X	X	X	X	X	X
GW-070102-040711-NH-017	G-113D	Groundwater	-	4/7/2011	8:24	X	X	X	X	X	X	X	X
GW-070102-040711-NH-018	G-101S	Groundwater	MS/MSD	4/7/2011	9:45	X	X	X	X	X	X	X	X
GW-070102-040711-NH-019	G-101S	Groundwater	DUP (018)	4/7/2011	9:50	X	X	X	X	X	X	X	X
TB-070102-040711-NH-002	-	Water	Trip Blank	4/7/2011	9:04	X							X

Notes:

QC - Quality Control
VOC - Volatile Organic Compounds
TDS - Total Dissolved Solids
TTHM - Total Trihalomethanes
DUP - Field Duplicate Sample of sample in parenthesis
MS/MSD - Matrix Spike/Matrix Spike Duplicate
TA-NC - TestAmerica Laboratories, Inc. - North Canton, Ohio

TABLE 2

SUMMARY OF ANALYTICAL METHODS, HOLDING TIME PERIODS, AND PRESERVATIVES
LANDFILL WELL INSTALLATION AND SAMPLING - APRIL 2011
CATERPILLAR - MAPLETON 817 LANDFILL
MAPLETON, ILLINOIS

Parameter	*Method*[1]	*Matrix*	*Holding Time*	*Preservation*
Select VOC	SW-846 8260B	Water	- 14 days from sample collection to completion of analysis.	pH < 2 and Iced, 4 ± 2° C
Select Metals		Water	- 180 days from sample collection to completion of analysis	pH < 2 and Iced, 4 ± 2° C
Arsenic	SW-846 6010B			
Barium	SW-846 6010B			
Cadmium	SW-846 6010B			
Chromium	SW-846 6010B			
Copper	SW-846 6010B			
Iron	SW-846 6010B			
Lead	SW-846 6010B			
Manganese	SW-846 6010B			
Selenium	SW-846 6010B			
Zinc	SW-846 6010B			
Chloride	SW-846 9056A	Water	- 28 days from sample collection to completion of analysis.	Iced, 4 ± 2° C
Fluoride	SW-846 9056A	Water	- 28 days from sample collection to completion of analysis.	Iced, 4 ± 2° C
Nitrate as Nitrogen	SW-846 9056A	Water	- 48 hours from sample collection to completion of analysis.	Iced, 4 ± 2° C
Sulfate	SW-846 9056A	Water	- 28 days from sample collection to completion of analysis.	Iced, 4 ± 2° C
TDS	SM18 2540 C	Water	- 7 days from sample collection to completion of analysis.	Iced, 4 ± 2° C
TTHM	SW-846 8260B	Water	- 14 days from sample collection to completion of analysis.	pH < 2 and Iced, 4 ± 2° C

Notes:

[1] Method References:

SW-846 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, 3rd Edition, and Promulgated updates, November 1986
SM18 - "Standard Methods for the Examination of Water and Wastewater", 18th Edition, 1992

VOC - Volatile Organic Compounds
TDS - Total Dissolved Solids
TTHM - Total Trihalomethanes

TABLE 3

SUMMARY OF QUALIFIED SAMPLE DATA DUE TO OUTLYING MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERIES
LANDFILL WELL INSTALLATION AND SAMPLING - APRIL 2011
CATERPILLAR - MAPLETON 817 LANDFILL
MAPLETON, ILLINOIS

Parameter	*Affected Sample ID*	*Analyte*	*MS Recovery (percent)*	*MSD Recovery (percent)*	*RPD (percent)*	*Control Limits*		*Qualified Result*	*Units*
						Recovery (percent)	*RPD (percent)*		
Sulfate	GW-070102-040611-NH-009	Sulfate	62	53	2.0	80-120	0-20	193 J	mg/L

Notes:

J - Estimated concentration

MS - Matrix Spike
MSD - Matrix Spike Duplicate
RPD - Relative Percent Duplicate
mg/L - milligrams per liter

ATTACHMENT D

PROUCL WRS/MANN-WHITNEY TESTS INPUT DATA FILE

ATTACHMENT D.1
(LEACHATE WELLS VS.LYSIMETERS)

Depth Group	Location Group	Location	Sample ID	Date	Total dissolved solids (TDS)_orig (mg/L)	TDS	D_TDS
n/a	LYSIMETERS	LS301	WL-053111-TP-006	31/05/2011 12:00 AM	920	920	1
n/a	LYSIMETERS	LS301	WL-062211-JB 004	22/06/2011 12:00 AM	1100	1100	1
n/a	LYSIMETERS	LS302	WL-052511-TP-001/002	25/05/2011 12:00 AM	730 /1100	915	1
n/a	LYSIMETERS	LS302	WL-062211-JB 002/005	22/06/2011 12:00 AM	790/750	770	1
n/a	LYSIMETERS	LS303	WL-052511-TP-004	25/05/2011 12:00 AM	780	780	1
n/a	LYSIMETERS	LS303	WL-062211-JB 003	22/06/2011 12:00 AM	950	950	1
n/a	LYSIMETERS	LS304	WL-052511-TP-003	25/05/2011 12:00 AM	1400b	1400	1
n/a	LYSIMETERS	LS304	WL-062211-JB 001	22/06/2011 12:00 AM	1500b	1500	1
n/a	LYSIMETERS	LS305	WL-053111-TP-005	31/05/2011 12:00 AM	1200	1200	1
n/a	LEACHATE WELLS	L301	L301	16/05/2011 12:00 AM	1300b	1300	1
n/a	LEACHATE WELLS	L302	L302	16/05/2011 12:00 AM	2000b	2000	1
n/a	LEACHATE WELLS	L303R	L303R	17/05/2011 12:00 AM	1000	1000	1
n/a	LEACHATE WELLS	L304	L304	17/05/2011 12:00 AM	1200	1200	1
n/a	LEACHATE WELLS	L305	L305	17/05/2011 12:00 AM	1400b	1400	1
n/a	LEACHATE WELLS	L301	L301	04/08/2010 12:00 AM	1400	1400	1
n/a	LEACHATE WELLS	L302	L302	08/04/2010 12:00 AM	2000	2000	1
n/a	LEACHATE WELLS	L303	L303R	08/04/2010 12:00 AM	1400	1400	1
n/a	LEACHATE WELLS	L304	L304	08/04/2010 12:00 AM	1100	1100	1
n/a	LEACHATE WELLS	L305	L305	08/04/2010 12:00 AM	1300	1300	1
n/a	LEACHATE WELLS	L304	L304R	20/12/2010 12:00:00 AM	1200	1200	1
n/a	LEACHATE WELLS	L301	L301	21/12/2010 12:00:00 AM	1400	1400	1
n/a	LEACHATE WELLS	L302	L302	21/12/2010 12:00:00 AM	2200	2200	1
n/a	LEACHATE WELLS	L303	L303R	21/12/2010 12:00:00 AM	1000	1000	1
n/a	LEACHATE WELLS	L305	L305	21/12/2010 12:00:00 AM	1300	1300	1
n/a	LEACHATE WELLS	L301	L301	10/10/2011 12:00 AM	10 U	10	0
n/a	LEACHATE WELLS	L305	L305	10/10/2011 12:00 AM	1500	1500	1
n/a	LEACHATE WELLS	L302	L302	10/11/2011 12:00 AM	2200	2200	1
n/a	LEACHATE WELLS	L303	L303R	10/11/2011 12:00 AM	950	950	1
n/a	LEACHATE WELLS	L304	L304R	10/11/2011 12:00 AM	1100	1100	1

ATTACHMENT D.2
(SHALLOW DOWNGRADIENT VS. COMBINED UPGRADIENT)

Depth Group	Location Group	Location	TDS	D_TDS
Shallow	Downgradient	G104S	1060	1
Shallow	Downgradient	G104S	1100	1
Shallow	Downgradient	G105S	1100	1
Shallow	Downgradient	G105S	1200	1
Shallow	Downgradient	G106S	1190	1
Shallow	Downgradient	G106S	1200	1
Shallow	Downgradient	G111S	1210	1
Shallow	Downgradient	G111S	1200	1
Shallow	Upgradient	G110S	1000	1
Shallow	Upgradient	G110S	840	1
Shallow	Upgradient	G110S	830	1
Shallow	Upgradient	G110S	790	1
Shallow	Upgradient	G112S	1060	1
Shallow	Upgradient	G112S	1000	1
Shallow	Upgradient	G112S	1000	1
Shallow	Upgradient	G112S	950	1
Shallow	Upgradient	G113S	805	1
Shallow	Upgradient	G113S	750	1
Shallow	Upgradient	G113S	750	1
Shallow	Upgradient	G113S	780	1
Deep	Upgradient	G110D	1370	1
Deep	Upgradient	G110D	1300	1
Deep	Upgradient	G110D	1400	1
Deep	Upgradient	G110D	1300	1
Deep	Upgradient	G112D	1580	1
Deep	Upgradient	G112D	1500	1
Deep	Upgradient	G112D	1500	1
Deep	Upgradient	G112D	1500	1
Deep	Upgradient	G113D	3050	1
Deep	Upgradient	G113D	870	1
Deep	Upgradient	G113D	1100	1
Deep	Upgradient	G113D	950	1

ATTACHMENT D.3
(DEEP DOWNGRADIENT VS. COMBINED UPGRADIENT)

Depth Group	Location Group	Location	TDS	D_TDS
Deep	Downgradient	G103D	1380	1
Deep	Downgradient	G103D	1100	1
Deep	Downgradient	G104D	654	1
Deep	Downgradient	G104D	400	1
Deep	Downgradient	G111D	860	1
Deep	Downgradient	G111D	850	1
Shallow	Upgradient	G110S	1000	1
Shallow	Upgradient	G110S	840	1
Shallow	Upgradient	G110S	830	1
Shallow	Upgradient	G110S	790	1
Shallow	Upgradient	G112S	1060	1
Shallow	Upgradient	G112S	1000	1
Shallow	Upgradient	G112S	1000	1
Shallow	Upgradient	G112S	950	1
Shallow	Upgradient	G113S	805	1
Shallow	Upgradient	G113S	750	1
Shallow	Upgradient	G113S	750	1
Shallow	Upgradient	G113S	780	1
Deep	Upgradient	G110D	1370	1
Deep	Upgradient	G110D	1300	1
Deep	Upgradient	G110D	1400	1
Deep	Upgradient	G110D	1300	1
Deep	Upgradient	G112D	1580	1
Deep	Upgradient	G112D	1500	1
Deep	Upgradient	G112D	1500	1
Deep	Upgradient	G112D	1500	1
Deep	Upgradient	G113D	3050	1
Deep	Upgradient	G113D	870	1
Deep	Upgradient	G113D	1100	1
Deep	Upgradient	G113D	950	1

ATTACHMENT E

PROUCL WRS/MANN-WHITNEY TESTS OUTPUT SHEETS

ATTACHMENT E.1

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	70102 ProUCL Data -- Leachate wells vs. Lysimeters TDS.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: TDS(leachate wells)

Background Data: TDS(lysimeters)

Raw Statistics

	Site	Background
Number of Valid Data	20	9
Number of Non-Detect Data	1	0
Number of Detect Data	19	9
Minimum Non-Detect	10	N/A
Maximum Non-Detect	10	N/A
Percent Non detects	5.00%	0.00%
Minimum Detected	950	770
Maximum Detected	2200	1500
Mean of Detected Data	1418	1059
Median of Detected Data	1300	950
SD of Detected Data	395.5	261.2

Wilcoxon-Mann-Whitney Site vs Background Test

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	344
WMW Test U-Stat	134
WMW Critical Value (0.050)	125
Approximate P-Value	0.0202

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

ATTACHMENT E.2

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	70102 ProUCL Data -- Shallow Downgradient vs. Pooled upgradient TDS.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: TDS(downgradient)

Background Data: TDS(upgradient)

Raw Statistics

	Site	Background
Number of Valid Data	8	24
Number of Non-Detect Data	0	0
Number of Detect Data	8	24
Minimum Non-Detect	N/A	N/A
Maximum Non-Detect	N/A	N/A
Percent Non detects	0.00%	0.00%
Minimum Detected	1060	750
Maximum Detected	1210	3050
Mean of Detected Data	1158	1166
Median of Detected Data	1195	1000
SD of Detected Data	60.18	486.9

Wilcoxon-Mann-Whitney Site vs Background Test

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	153.5
WMW Test U-Stat	0.914
WMW Critical Value (0.050)	1.645
P-Value	0.18

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

ATTACHMENT E.3

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	70102 ProUCL Data -- Deep Downgradient vs. Pooled upgradient TDS.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: TDS(downgradient)

Background Data: TDS(upgradient)

Raw Statistics

	Site	Background
Number of Valid Data	6	24
Number of Non-Detect Data	0	0
Number of Detect Data	6	24
Minimum Non-Detect	N/A	N/A
Maximum Non-Detect	N/A	N/A
Percent Non detects	0.00%	0.00%
Minimum Detected	400	750
Maximum Detected	1380	3050
Mean of Detected Data	874	1166
Median of Detected Data	855	1000
SD of Detected Data	340.9	486.9

Wilcoxon-Mann-Whitney Site vs Background Test

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	67.5
WMW Test U-Stat	-1.348
WMW Critical Value (0.050)	1.645
P-Value	0.911

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

ATTACHMENT F

QUANTILE TEST CALCULATIONS

ATTACHMENT F.1

Depth Group	Location Group	Location	Sample ID	Date	solids (TDS)_orig (mg/L)	Treat as	Rank
n/a	LYSIMETERS	LS301	WL-053111-TP-006	5/31/2011	920	920	25
n/a	LYSIMETERS	LS301	WL-062211-JB 004	6/22/11	1100	1100	18
n/a	LYSIMETERS	LS302	WL-052511-TP-001/002	5/25/2011	730 /1100	915	26
n/a	LYSIMETERS	LS302	WL-062211-JB 002/005	6/22/11	790/750	770	28
n/a	LYSIMETERS	LS303	WL-052511-TP-004	5/25/2011	780	780	27
n/a	LYSIMETERS	LS303	WL-062211-JB 003	6/22/11	950	950	23
n/a	LYSIMETERS	LS304	WL-052511-TP-003	5/25/2011	1400b	1400	7
n/a	LYSIMETERS	LS304	WL-062211-JB 001	6/22/11	1500b	1500	5
n/a	LYSIMETERS	LS305	WL-053111-TP-005	5/31/2011	1200	1200	15
n/a	LEACHATE WELLS	L301	L301	5/16/2011	1300b	1300	12
n/a	LEACHATE WELLS	L302	L302	5/16/2011	2000b	2000	3
n/a	LEACHATE WELLS	L303R	L303R	5/17/2011	1000	1000	21
n/a	LEACHATE WELLS	L304	L304	5/17/2011	1200	1200	15
n/a	LEACHATE WELLS	L305	L305	5/17/2011	1400b	1400	7
n/a	LEACHATE WELLS	L301	L301	08/04/2010 12:00:00 AM	1,400	1,400	7
n/a	LEACHATE WELLS	L302	L302	04/08/2010 12:00:00 AM	2,000	2,000	3
n/a	LEACHATE WELLS	L303	L303R	04/08/2010 12:00:00 AM	1,400	1,400	7
n/a	LEACHATE WELLS	L304	L304	04/08/2010 12:00:00 AM	1,100	1,100	18
n/a	LEACHATE WELLS	L305	L305	04/08/2010 12:00:00 AM	1,300	1,300	12
n/a	LEACHATE WELLS	L304	L304R	20/12/2010 12:00:00 AM	1,200	1,200	15
n/a	LEACHATE WELLS	L301	L301	21/12/2010 12:00:00 AM	1,400	1,400	7
n/a	LEACHATE WELLS	L302	L302	21/12/2010 12:00:00 AM	2,200	2,200	1
n/a	LEACHATE WELLS	L303	L303R	21/12/2010 12:00:00 AM	1,000	1,000	21
n/a	LEACHATE WELLS	L305	L305	21/12/2010 12:00:00 AM	1,300	1,300	12
n/a	LEACHATE WELLS	L301	L301	10/10/2011 12:00:00 AM	10 U	10	29
n/a	LEACHATE WELLS	L305	L305	10/10/2011 12:00:00 AM	1,500	1,500	5
n/a	LEACHATE WELLS	L302	L302	11/10/2011 12:00:00 AM	2,200	2,200	1
n/a	LEACHATE WELLS	L303	L303R	11/10/2011 12:00:00 AM	950	950	23
n/a	LEACHATE WELLS	L304	L304R	11/10/2011 12:00:00 AM	1,100	1,100	18

	ceiling	significance	s (crit) 0.05	m= 9	n= 20	s(Leach)
0.50 quantile	c= 14	α = 0.1	12			12
0.75 quantile	c= 7	α = 0.05	7			9
0.90 quantile	c= 3	no table value	no table value			4

conclusion: Leach>Lys

NOTE: CRITICAL VALUES ARE FROM TABLE A-19 OF EPA QA/G-9S (2006)
DIRECTIONS FOR THE QUANTILE TEST ARE FOUND IN BOX 3-35 OF EPA QA/G-9S (2006)

ATTACHMENT F.2

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options

From File	70102 ProUCL Data -- Shallow Downgradient vs. Pooled upgradient TDS.wst
Full Precision	OFF
Confidence Coefficient	95%
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration

Area of Concern Data: TDS(downgradient)

Background Data: TDS(upgradient)

Raw Statistics

	Site	Background
Number of Valid Data	8	24
Number of Non-Detect Data	0	0
Number of Detect Data	8	24
Minimum Non-Detect	N/A	N/A
Maximum Non-Detect	N/A	N/A
Percent Non detects	0.00%	0.00%
Minimum Detected	1060	750
Maximum Detected	1210	3050
Mean of Detected Data	1158	1166
Median of Detected Data	1195	1000
SD of Detected Data	60.18	486.9

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.043)	6
Approximate K Value (0.043)	4
Number of Site Observations in 'R' Largest	0
Calculated Alpha	0.0228

Conclusion with Alpha = 0.043

Do Not Reject H0, Perform Wilcoxon-Mann-Whitney or Gehan Test

ATTACHMENT F.3

Quantile Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options

From File	70102 ProUCL Data -- Deep Downgradient vs. Pooled upgradient TDS.wst
Full Precision	OFF
Confidence Coefficient	95%
Null Hypothesis	Site or AOC Concentration Less Than or Equal to Background Concentration (Form 1)
Alternative Hypothesis	Site or AOC Concentration Greater Than Background Concentration

Area of Concern Data: TDS(downgradient)

Background Data: TDS(upgradient)

Raw Statistics

	Site	Background
Number of Valid Data	6	24
Number of Non-Detect Data	0	0
Number of Detect Data	6	24
Minimum Non-Detect	N/A	N/A
Maximum Non-Detect	N/A	N/A
Percent Non detects	0.00%	0.00%
Minimum Detected	400	750
Maximum Detected	1380	3050
Mean of Detected Data	874	1166
Median of Detected Data	855	1000
SD of Detected Data	340.9	486.9

Quantile Test

H0: Site Concentration <= Background Concentration (Form 1)

Approximate R Value (0.041)	6
Approximate K Value (0.041)	3
Number of Site Observations in 'R' Largest	0
Calculated Alpha	0.0754

Conclusion with Alpha = 0.041

Do Not Reject H0, Perform Wilcoxon-Mann-Whitney or Gehan Test

EXHIBIT B

PREPARED BY:

Name: _____

_____

Address: _____

RETURN TO:

Name: _____

_____

Address: _____

Environmental Land Use Control

8826 West Route 24

Mapleton, Peoria County, Illinois

THIS ENVIRONMENTAL LAND USE CONTROL ("ELUC"), is made this [] day of December, 2013, by Caterpillar Inc., ("Property Owner") for the area encompassing the on-site potentially reusable foundry sand landfill as more particularly described in Exhibit A (the "Foundry Landfill"), located at the common address 8826 West Route 24 Mapleton, Peoria County (the "Property").

WHEREAS, 415 ILCS 5/58.17 and 35 Ill. Adm. Code 742 provide for the use of an ELUC as an institutional control to impose land use limitations or requirements in order to ensure protection of human health and the environment;

WHEREAS, the limitations and requirements contained herein are being established to limit exposure to groundwater with elevated levels of total dissolved solids ("TDS") above established Class I groundwater quality standards that may be present at the Foundry Landfill as a result of site activities and upgradient background concentrations;

WHEREAS, Property Owner has requested and the Illinois Environmental Protection Agency ("IEPA") has recommended an adjusted standard from 35 Ill. Admin. Code 620.410(a) and 35 Ill. Admin. Code 817.106(a) for the Class I groundwater quality standard for TDS in order to adjust the maximum allowable leachate concentration ("MALC") for TDS at the Foundry Landfill;

WHEREAS, Property Owner and IEPA agree that in light of observed levels of TDS in groundwater at the site, an ELUC for the Foundry Landfill would be protective of human health and the environment;

NOW, THEREFORE, the recitals set forth above are incorporated by reference as if fully set forth herein, and the Property Owner agrees as follows:

Date: _____By:_____

Director

Section One. Property Owner does hereby establish an ELUC on the area encompassing the Foundry Landfill at the Property.

Attached as Exhibit B are site maps that show the legal boundary of the Property, as well as the area and physical features to which the ELUC applies.

Section Two. Property Owner represents and warrants it is the current owner of the Property and has the authority to record this ELUC on the chain of title for the Property with the Office of the Recorder or Registrar of Titles in Peoria County, Illinois.

Section Three. The Property Owner hereby agrees, for itself and its heirs, grantees, successors, assigns, transferees and any other owner, occupant, lessee, possessor or user of the Property or the holder of any portion thereof or interest therein, that the groundwater under the Property shall not be used as a potable supply of water.

Section Four. This ELUC is binding on the Property Owner, its heirs, grantees, successors, assigns, transferees and any other owner, occupant, lessee, possessor or user of the Property or the holder of any portion thereof or interest therein. This ELUC shall apply in perpetuity against the Property and shall not be released until the IEPA determines there is no longer a need for this ELUC as an institutional control; and until a release or modification of the land use limitation or requirement is filed on the chain of title for the Property.

Section Five. Information regarding Property Owner's petition for an adjusted standard for landfill leachate at the Foundry Landfill may be obtained from the Illinois Pollution Control Board under docket number AS 13-005 or from IEPA through a request under the Freedom of Information Act (5 ILCS 140) and rules promulgated thereunder by providing the IEPA with the docket number listed above.

Section Six. The effective date of this ELUC shall be the date that it is officially recorded in the chain of title for the Property to which the ELUC applies.

WITNESS the following signatures:

Property Owner(s)

By:_____

Its: _____

Date: _____

STATE OF ILLINOIS)

) SS:

COUNTY OF)

I, _____the undersigned, a Notary Public for said County and State, DO HEREBY CERTIFY, that _____ and _____, personally known to me to be the Property Owner(s) of _____, and personally known to me to be the same persons whose names are subscribed to the foregoing instrument, appeared before me this day in person and severally acknowledged that in said capacities they signed and delivered the said instrument as their free and voluntary act for the uses and purposes therein set forth.

Given under my hand and official seal, this _____ day of _____, 20__.

Notary Public

STATE OF _____)

) S.S.

COUNTY OF _____)

I, _____, a notary public, do hereby certify that before me this day in person appeared _____, personally known to me to be the Property Owner(s), of _____, each severally acknowledged that they signed and delivered the foregoing instrument as the Property Owner(s) herein set forth, and as their own free and voluntary act, for the uses and purposes herein set forth.

Given under my hand and seal this _____ day of _____, 20__.

Notary Public

PIN NO. XX-XX-XXX-XXX-XXXX

(Parcel Index Number)

Attachment 1

The subject property is located in the City of _____, _____ County, State of Illinois, commonly known as _____, _____, Illinois and more particularly described as:

LIST THE COMMON ADDRESS;

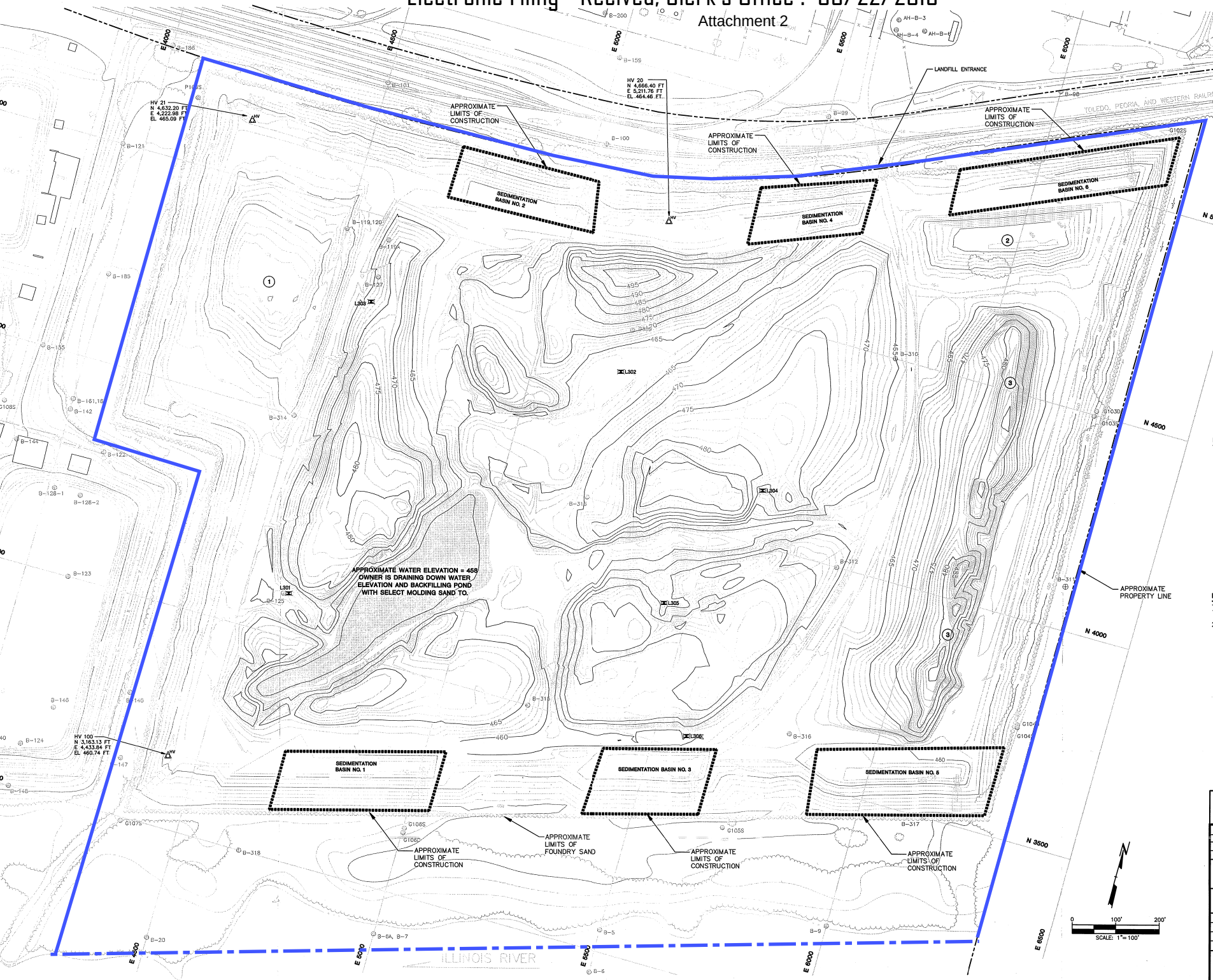
LEGAL DESCRIPTION; AND

REAL ESTATE TAX INDEX OR PARCEL #

(PURSUANT TO SECTION 742. 1010(d)(2))

PIN NO. XX-XX-XXX-XXX-XXXX

Attachment 2



LEGEND

1. LOCATION OF NORTHWEST CLAY S
2. LOCATION OF NORTHEAST CLAY S
3. LOCATION OF EAST SELECT MOLDI

SITE BENCHMARKS		
BM	NORTHING	EASTING
HV 20	N 4,666.40 FT	E 5,211.76 FT
HV 21	N 4,632.20 FT	E 4,222.98 FT
HV 100	N 3,163.13 FT	E 4,433.84 FT

NOTES

1. SEE SHEET 2 OF 6 FOR LEGEND AN
2. BASE MAP OUTSIDE THE LIMITS OF I TAKEN FROM AN AERIAL PHOTO PER ALLEN GROUP, URBANA, ILLINOIS, DA TOPOGRAPHIC DATA WITHIN THE LIMI TAKEN FROM AN AERIAL SURVEY P MAPPING SERVICES, INC., 405 EAST URBANA, ILLINOIS 61803-0755, DAT GROUND CONTROL SURVEYS WERE F & ASSOCIATES, ENGINEERS, INC., 75 PEORIA, ILLINOIS 61615.

NOTE: THESE PLANS ARE ACCOMPANIED BY A R TITLE. THESE DOCUMENTS ARE INTERRELA TO BE USED AND REVIEWED TOGETHER. ARE INTENDED TO BE USED FOR REGULA

NO.	BY	DATE	REVISION
3.			
2.			
1.			

PROJECT: CQA DOCUMENTATION SEDIMENTATION BASI CATERPILLAR INC. MAP

SHEET TITLE: EXISTING CONDITI

DRAWN BY: REYZEKD	SCALE: 1"=100'
CHECKED BY: EAS	
APPROVED BY: RJV	DATE PRINTED: JAN 27 2000
DATE: JANUARY 2000	

RMT

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF: PETITION OF CATERPILLAR INC. FOR AN ADJUSTED STANDARD FROM 35 ILL. ADM. CODE 620.410(a) AND 817.106(a)	AS 13 - 5 (Adjusted Standard)

RESPONSE TO AGENCY'S RECOMMENDATION

In support of its Petition for an Adjusted Standard in the above-captioned matter, dated June 27, 2013 ("Petition"), Caterpillar Inc. ("Caterpillar"), by its attorneys, Baker & McKenzie LLP, hereby responds to the Illinois Environmental Protection Agency's ("Agency") Recommendation to Petition for Adjusted Standard, dated August 9, 2013 ("Recommendation").

As noted in the Recommendation, Caterpillar and the Agency have engaged in extensive discussions and information exchanges concerning the need for and appropriateness of the requested adjusted standard as provided in Caterpillar's Petition. This productive dialogue provided a forum for deliberations on technical questions raised by the Agency and, ultimately, served as the basis for the Agency's Recommendation in favor of the Board's granting of the Petition.

While the Recommendation is unconditional, the Agency's August 9th submittal raises certain limited questions warranting clarification by Caterpillar as provided below:

1. Caterpillar confirms that the Agency's understanding is correct that "Petitioner used background (that is, uninfluenced by the Landfill) groundwater values to calculate the proposed [Background Threshold Value ("BTV")]" (Recommendation at 3). Reading the Petition as a whole, it is clear that the BTV was not calculated from leachate values at the Mapleton Landfill, but rather upgradient groundwater sampling results. (Petition at 8-9, 24).

The proposed adjusted standard of a maximum allowable leachate concentration ("MALC") for Total Dissolved Solids ("TDS") of 2,539 mg/L for leachate at the Mapleton Landfill is based on the statistical BTV using this upgradient groundwater data.

2. Caterpillar agrees with the Agency that a change in the relevant TDS MALC would only be applicable to leachate at the Mapleton Landfill and would not in any way change the nature and composition of the wastes that may be accepted for disposal at the Landfill. To the extent that the adjusted standard proposed in Section F of the Petition does not already include this limitation, Petitioner proposes the following underlined changes to the language proposed in the Petition:

a. Caterpillar is granted an adjusted standard from the Class I Groundwater Quality Standard for TDS at 35 Ill. Admin. Code 620.410. In lieu of the standard in 35 Ill. Admin. Code 620.410 applicable to TDS, the groundwater quality standard applicable to the Mapleton Landfill for TDS is 2,539 mg/L.

b. Pursuant to 35 Ill. Admin. Code 817.106(b), Caterpillar has demonstrated, using the groundwater impact assessment procedures of Section 817.413 and the adjusted groundwater quality standard, that an increase in the MALC for TDS at the Mapleton Landfill will not result in an exceedance of the adjusted groundwater quality standard.

c. Therefore, an adjusted MALC of 2,539 mg/L for TDS in 35 Ill. Admin. Code 817.106(a) <u>with respect to leachate at the Mapleton Landfill</u> is permissible based on the adjusted groundwater quality standard. <u>The adjusted groundwater quality standard granted herein shall apply to the Mapleton Landfill only with respect to the MALC for TDS in landfill leachate. The adjusted standard shall in no way change, modify or alter any permit or other regulatory obligations of Caterpillar relating to the nature, character and composition of the waste material accepted for disposal at the Mapleton Landfill</u>.

d. Caterpillar will record and maintain in perpetuity in the property records an Environmental Land Use Control ("ELUC") in accordance with 35 Ill. Admin. Code 742.1010. The ELUC will prohibit the use of groundwater at the Mapleton Landfill for potable purposes.

Dated: August 22, 2013

Baker & McKenzie LLP

John W. Watson
Daniel R. De Deo
Baker & McKenzie LLP
300 East Randolph Street
Suite 5000
Chicago, Illinois 60601
312-861-2646

CERTIFICATE OF SERVICE

I, the undersigned, certify that I have served the attached Response of Caterpillar Inc. for its Petition for an Adjusted Standard from 35 Ill. Admin. Code 620.410(a) and 817.106(a), upon the following persons on the 22nd day of August, 2013:

Division of Legal Counsel
Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276

Illinois Pollution Control Board, Attn: Clerk
James R. Thompson Center
1000 West Randolph Street
Suite 11-500
Chicago, Illinois 60601

Baker & McKenzie LLP

John W. Watson
Daniel R. De Deo
Baker & McKenzie LLP
300 East Randolph Street
Suite 5000
Chicago, Illinois 60601
312-861-2646