

September 14, 2018

Ms. Jennifer Means
Environmental Program Manager
Eastern Oil and Gas District
Pennsylvania Department of Environmental Protection
208 West Third Street, Suite 101
Williamsport, PA 17701

Re: Department Letter Dated June 11, 2018 Regarding “December 15, 2010 Consent Order and Settlement Agreement Continuing Compliance Issues” – Cabot Response to COSA-Related Matters

Dear Ms. Means:

This letter is written in reply to the referenced letter from the Pennsylvania Department of Environmental Protection (“Department”) regarding the December 15, 2010 Consent Order and Settlement Agreement (“COSA”) and the Department’s assertion of continuing compliance issues. The Department’s letter was received by Cabot Oil & Gas Corporation (“Cabot”) on June 14, 2018, and requests a response by September 14, 2018. Cabot expressly reserves its rights in connection with the statements made in this letter, but responds here to address your request for information.

In your letter, you discuss a number of ongoing projects which Cabot has with the Department, only some of which are related to the COSA. Therefore, to keep these issues separate, Cabot is responding with two letters – one COSA-related letter and one non-COSA-related letter.

Introduction

Before addressing the specific issues raised by the Department, Cabot wants to reiterate that its goal has been and continues to be the complete resolution of the COSA by working cooperatively with the Department. Nevertheless, Cabot must first begin by addressing the stated reason for the Department’s letter: responding to Cabot’s desire to recommence drilling in the Dimock/Carter Road Area.

This opening assertion overly simplifies why Cabot wants to bring final resolution to the COSA. It also downplays the years of communication between the parties and Cabot’s efforts pursuant to the COSA. Over the years, Cabot has made repeated efforts, based upon the voluminous amount of data acquired, to address, entirely or in part, the requirements of the COSA agreement. In particular, since July 17, 2014, Cabot was told on numerous occasions that closure letters would be sent imminently to at least some of the Property Owners. Over four years later, none of these letters have been sent, despite the overwhelming amount of scientific data collected and shared with the Department justifying their issuance. Attached as **Exhibit A** to this letter is a presentation prepared by the Department expressly stating that closure letters were to be sent to various individuals (See Slide #35). Whenever

Cabot would inquire about the status of these closure letters, it was told that the letters were drafted and would be sent either “shortly” or “soon”. At some point, and without a scientific basis, the Department decided to forego the letters.

Accordingly, Cabot’s desire to resolve the COSA involves more than drilling new wells. It is about ceasing unnecessary water testing based upon the voluminous amount of data that is referenced in the Department’s letter. It is about removing the stigma of an arbitrary area where Cabot cannot conduct operations, and it is about protecting the credibility of both Cabot and the Department.

In expressing its justification for maintaining the COSA, the Department begins by referencing Paragraph 3.a of the COSA and then attempts to reference matters outside the scope of the COSA. Before addressing these specific references, it is important to note that Cabot always operates in good faith to comply with the laws and regulations of the Commonwealth of Pennsylvania. The Department has been made fully aware of and involved with the substantial efforts and operations that Cabot has undertaken pursuant to the COSA.

Moreover, it is inappropriate to reference matters outside of the scope of the COSA as justification for maintaining this agreement. It is especially important to point out that Paragraph 3.a is limited to the Dimock/Carter Road Area and has to be read in conjunction with Paragraph 4, which references the wells identified on Exhibit B of the COSA or wells to be drilled within this area. Accordingly, Cabot disagrees with and reserves its right to contest any attempt by the Department to maintain the COSA due to activities unrelated to its scope and intent.

In order to address the alleged unresolved obligations, you requested that Cabot respond to five items. Below are Cabot’s individual responses to these requests.

Requests for Submittal (as numbered in the Department’s June 11, 2018 letter)

Request #1 – Report

This request is unrelated to the COSA and will be addressed in a separate letter from Cabot that will be submitted contemporaneously with this letter.

Request #2 – Water Supply Restoration/Replacement Plan

In your letter, you ask for a Water Supply Restoration/Replacement Plan to permanently restore/replace the three (3) other affected water supplies (Water Supplies #2, #3, and #4 on Exhibit A of your June 11, 2018, letter). Cabot responds as follows:

- **Water Supply #2** – As the Department is aware, Cabot has been working in good faith with the owner of Water Supply #2 to permanently restore/replace their water supply. Additionally, since becoming aware of the change in water quality, Cabot has and continues to comply with all Chapter 78a.51 requirements, inclusive of venting the water well and providing temporary bulk and drinking water to meet the resident’s needs. To this end, among providing assistance to the landowner with other beneficial improvements to their property unrelated to the water supply, Cabot has installed or offered the following:
 - Cabot drilled a new water well on the property (installed December 2014). As previously discussed with the Department, it is acknowledged that the conditions associated with the newly installed water well preclude this as the sole source to replace the existing water supply due to

yield of the well; however, with some modification, it is capable of providing water of acceptable quality.

- Cabot has offered to install a water treatment system for the existing water well. The proposed treatment system is currently in use at other locations with similar conditions and has been well documented as being effective to permanently restore the water supply. The offer to install a treatment system was initially verbally accepted by the resident, but the landowner subsequently rejected this treatment system after interactions with the Department. It should further be noted that the resident still heavily uses untreated water from this well, at their own discretion, despite their alleged safety concerns to Cabot to the contrary. Also, Cabot has other information that it can share with the Department to help it better understand the circumstances surrounding Cabot's attempts to resolve this complaint.
- After a desire was made known by the landowner to sell the property, Cabot also attempted to purchase the property. After initially accepting the offer, the landowner subsequently reneged on this sale. To this point, all reasonable offers to purchase the property have been unsuccessful.

Based on discussions with the Department on September 12, 2018, Cabot understands that the Department reached-out to the resident on September 7, 2018, to discuss the viability of installing a water treatment system as an acceptable permanent water restoration/replacement technique. With that conversation having taken place, Cabot will once again reach-out to the resident and offer to install a water treatment system. If the resident is amenable, Cabot will follow the prescribed process outlined in Request #2 of the June 11, 2018, letter. However, if the resident remains unwilling to accept said offer, Cabot will place an equivalent lump sum payment for the value of the treatment system in escrow with the Department for the resident's future availability, and Cabot will cease delivery of the temporary alternate water supply (bottled and bulk water).

- **Water Supplies #3 and #4** – For Water Supplies #3 and #4, Cabot previously submitted on February 20, 2015, a Chapter 78.89 Gas Migration Investigation Closure Report titled "Ratzel Pad Response Closure Report" and Cabot subsequently submitted on November 20, 2015, a response to comments from the Department titled "Response to PADEP June 24, 2015 Letter", demonstrating that the water supplies #3 and #4 were not impacted by drilling operations. Cabot awaited a formal response for over two and a half years, and Cabot periodically made inquiries regarding its status. However, it was not until June 20, 2018, that the Department sent an e-mail to Cabot summarily stating that it disagreed with the conclusions of Cabot's subject matter expert report. Given the extensive time, effort and expense that went into investigating, gathering required information, and preparing the Report(s) to comply with the requirements of Chapter 78.89, and to provide sound science to demonstrate that the water supplies were not impacted by drilling operations, Cabot is requesting a formal technical response from the Department that can be evaluated against the information and data collected to-date. Such a technical response will allow Cabot to provide additional clarification, as necessary.

As Cabot does not agree with the Department's assertion that these water supplies have been impacted and as Cabot has demonstrated that these two water supplies are consistent with naturally occurring conditions in this area – in fact, an affidavit by the owner of Water Supply #4 clearly supports Cabot's findings. Therefore, Cabot has demonstrated that permanent water supply restoration/replacement is not warranted for these water supplies.

Nonetheless, as requested in the Department's June 20, 2018, e-mail, Cabot agrees to perform another round of pressure build-up testing (PBUT) of the annuli associated with each of the Ratzel Pad gas wells (Ratzel 1H, Ratzel 2H, and Ratzel 3V) as provided in Request #3 (below) along with corresponding water supply sampling at Water Supplies #3 and #4. Consequently, Cabot will defer further discussion pertaining to the water supply restoration/replacement for these two water supplies until the additional PBUT data/information is collected and evaluated.

Request #3 – Gas Well Evaluation/Remediation Plan and Schedule

Based on the list of priority gas wells identified by the Department, Cabot, to-date, has performed 72-hour PBUTs in coordination with the Department to evaluate the mechanical integrity of the following wells:

- Ely 4H – PBUTs conducted during July 2010, September 2011, and October 2011 showed no pressure buildup in any annuli for the Ely 4H. Additionally, a PBUT was conducted in August 2017 with no pressure observed on any annuli for the Ely 4H. Based on these four results, the mechanical integrity of the 4H well should be deemed confirmed and no further action necessary.
- Ely 6H – A series of PBUTs was performed over time on the Ely 6H annuli, with the most recent being performed in May 2018. The May 2018 PBUT showed 84.4 psi on the 4x7 annulus. Consequently, Cabot prepared a workover procedure and executed a series of remedial cement squeeze jobs in June and July of 2018. A subsequent PBUT was performed in July 2018 with some pressure showing on the 4x7 annulus. The Department states that this pressure “appears to remain indicative of defective cement.” Accordingly, Cabot requests a technical meeting or conference call to further discuss the status of this well.

Incidentally, Cabot reached a water restoration and replacement settlement agreement with the landowner that the Department has associated with this well. Confirmation of this settlement will be provided to the Department separately.

- Gesford 2V/7H – A 72-hour PBUT was performed on each of the Gesford 2H and 7H gas wells between 9/4/2018 and 9/7/2018 in conjunction with water supply sampling of the [REDACTED] residence. At the conclusion of the test, it was identified that the connections to the vent lines were leaking. As a result, the connections will be tightened and the PBUTs rerun. However, the PBUT did show pressure on the cemented annuli of both wells. Consequently, the Department is alleging defective casing/cementing and has requested that Cabot submit a remedial plan by 10/10/2018.

Additional PBUT testing will be performed according to the schedule as follows:

1. Gesford 2V/7H (retest) – shut-in (“SI”) on 9/18/2018 and open up on 9/21/2018
2. Grimsley 1V/2H – SI on 9/25/2018 and open up on 9/28/2018
3. Ely 5H – SI on 10/2/2018 and open up on 10/5/2018
4. Ratzel 1H/2H/3V – SI on 10/9/2018 and open up on 10/12/2018

At the conclusion of the PBUT testing, the information and data collected will be evaluated and shared with the Department. According to Paragraph 5.a.iv of the COSA, if the resultant pressure data is in compliance with Chapter 78a, the mechanical integrity of the associated gas well is intact. If said data is not in compliance, then a plan to perform remedial work will be prepared and submitted to the Department for its approval, and implemented as appropriate.

Ratzel 1H/2H/3V – As discussed previously, Cabot has submitted a closure report for the Ratzel 1H/2H/3V detailing the mechanical integrity of these wells; however, Cabot will agree to additional PBUT testing per the above schedule.

Gesford 3/9 – The Gesford 3 and Gesford 9 wells were formally plugged and abandoned (P&A) in accordance with a Department approved Work Plan and no further testing is warranted.

Costello 1V – The Costello 1V has been milled out and is effectively plugged. Consequently, a PBUT cannot be performed on this well. Cabot proposes to formally P&A this well once the water quality issues associated with Water Supply #2 have been resolved. Per the July 5, 2018, inspection report (Inspection Record No. 2749454), no measurable vent flow was detected and a gas check of the vent tank showed no presence of methane.

Request #4 – Water Supply Sampling Plan and Schedule

In your letter, you ask for a “Water Supply Sampling Plan and Schedule” for on-going monitoring of the four water supplies identified in Exhibit A of your June 11, 2018, letter (referenced here as Water Supplies #1, #2, #3 and #4), as well as the first thirteen water supplies under Section C of your letter.

Water Supplies #1, #2, #3, and #4

- **Water Supply #1** – As discussed above, this water supply is unrelated to the COSA and will be addressed in a separate letter from Cabot that will be submitted contemporaneously with this letter.
- **Water Supply #2** – As discussed under Request #2 (above), Cabot has been actively working with the landowner to permanently restore/replace the water supply. Further, extensive sampling has been conducted at this residence, with sampling for headspace and dissolved methane currently conducted bi-weekly. As demonstrated by the data, the dissolved methane concentration is highly variable and highly dependent on water usage. Consequently, given the extensive data collected to date and the understanding that conditions are well established, Cabot is proposing that sampling frequency for dissolved gas and headspace be reduced to quarterly going forward. This frequency may be adjusted based on the final remedy for the water supply, should the resident be amenable to the installation of a water treatment system, or should additional mechanical integrity testing and gas well remedial work be performed.
- **Water Supplies #3 and #4** – As discussed under Request #2 (above), Cabot believes these water supplies have not been impacted and are at background. As such, Cabot asserts that ongoing water quality monitoring is not warranted for these water supplies.

Nonetheless, Cabot will continue bi-weekly sampling at these residences until the additional PBUT testing associated with the Ratzel Pad gas wells (Ratzel 1H/2H/3V) is completed. Consequently, Cabot will defer further discussion pertaining to water quality monitoring for these two water supplies until the additional PBUT data/information is collected and evaluated.

As discussed during the May 30, 2018 meeting, Cabot was to schedule confirmation sampling of the original COSA residents with the Department as soon as practicable. This split sampling occurred on July 17, 2018, and July 18, 2018; the findings as well as the proposed ongoing sampling schedule are summarized below. Time series graphs showing dissolved methane and well headspace combustible gas associated with each subject residential water well are provided in **Exhibit 2** to support the conclusions presented below.

COSA (13 Residences)

Abandoned:

- [REDACTED] – Not sampled. This water supply was abandoned by the new owner and is no longer accessible. Cabot is requesting that this water supply be removed from the COSA.

At Background (Dissolved Methane Non-detect or Near Non-detect):

- [REDACTED] – Cabot has provided substantial data demonstrating this water supply is at background. The most recent sample, which was split with the Department, was conducted on 7/17/2018 and demonstrated the following: dissolved methane concentration – <0.005 mg/L and well headspace measurement - 100 ppm (<1% of LEL).
- [REDACTED] – Cabot has provided substantial data demonstrating this water supply is at background. The most recent sample, which was split with the Department, was conducted on 7/18/2018 and demonstrated the following: dissolved methane concentration – 0.420 mg/L and well headspace measurement – 0 ppm (0% of LEL).
- [REDACTED] – Cabot has provided substantial data demonstrating this water supply is at background. The most recent sample, which was split with the Department, was conducted on 7/18/2018 and demonstrated the following: dissolved methane concentration – 0.380 mg/L and well headspace measurement - 0 ppm (0% of LEL).
- [REDACTED] – Cabot has provided substantial data demonstrating this water supply is at background. The most recent sample, which was split with the Department, was conducted on 7/17/2018 and demonstrated the following: dissolved methane concentration – 0.041 mg/L and well headspace measurement - 0 ppm (0% of LEL).
- [REDACTED] – Access was requested but refused by the resident to conduct sampling. Cabot has not had access to this property since September 2017. Nevertheless, Cabot has provided substantial data demonstrating this water supply is at a background.

For each of these landowners, Cabot believes, based upon the substantial amount of testing data, these water supplies are at background. Consequently, Cabot requests that, as provided under Paragraph 5.b of the COSA, the Department concur with Cabot's determination that the concentrations of methane are at background levels for the aquifers that supply these water supplies and requests that the Department approves the cessation of sampling for these water supplies. Graphic presentations of the dissolved methane and well headspace over time are presented in **Exhibit 2**.

At Background (Dissolved Methane Present):

- [REDACTED] – While Cabot was not able to collect data at the residence at the frequency of other water supplies due to lack of access related to litigation and a subsequent change in ownership, Cabot has nonetheless provided substantial data demonstrating this water supply is at background. The most recent sample, which was split with the Department, was conducted on 7/18/2018 and demonstrated the following: dissolved methane concentration – 4.9 mg/L

and well headspace measurement - 7960 ppm (<25% of LEL). This well is properly vented according to Department-approved best management practices and poses no threat to persons or property.

The well has demonstrated variability over time but the recent confirmatory data is consistent with that observed historically and, more specifically, the most recent prior data point collected on 5/22/2014 of 3.6 mg/L. While an outlier, the well headspace measurement of <16% LEL remains well below the Department's threshold of 25% LEL as per Chapter 78a.89(d)(2).

- [REDACTED] - While Cabot was not able to collect data at the residence at the frequency of other water supplies due to lack of access related to litigation, Cabot has nonetheless provided substantial data demonstrating this water supply is at background. The most recent sample, which was split with the Department, was conducted on 7/17/2018 and demonstrated the following: dissolved methane concentration - 1.8 mg/L and well headspace measurement - not accessible (hornet nest in wellhead). However, this well is properly vented according to Department-approved best management practices and poses no threat to persons or property.

The data is consistent with that observed historically, and no values above the Department's threshold of 7 mg/L have been observed since 2009 (Department result of 7.360 mg/L on 3/9/2009). Historical well headspace measurements were all non-detect.

For each of these residences, Cabot believes, based upon the substantial amount of testing data, these water supplies are at background. Consequently, Cabot requests that, as provided under Paragraph 5.b of the COSA, the Department concur with Cabot's determination that the concentrations of methane are at background levels for the aquifers that supply these water supplies and requests that the Department approve the cessation of sampling for these water supplies. Graphic presentations of the dissolved methane and well headspace over time are presented in **Exhibit 2**.

Dissolved Methane Present – Recommend Additional Evaluation:

- [REDACTED] - The most recent split sample with the Department was conducted on 7/17/2018 and demonstrated the following: dissolved methane concentration - 16 mg/L and well headspace measurement - 380 ppm (<1% of LEL). Prior to that, the water supply had historical dissolved methane concentrations that ranged between 0.39 mg/L and 4.8 mg/L, while historical well headspace measurements were at or near non-detect (i.e. 0% of LEL).

During the initial sampling event on July 17, 2018, the landowner stated that the well was not frequently used (not a primary residence) and elevated field turbidity and slight observed discoloration of the water were consistent with conditions typical of an unused water well. This was the primary residence of the prior owners, who used the water supply daily. Subsequent to the recent split sample on 07/17/2018, another sample was collected on August 16, 2018, following an extended purge of 42 minutes which showed a decrease in dissolved methane to 12 mg/L and general improvement of other water chemistry parameters. Graphic presentations of the dissolved methane and well headspace over time are presented in **Exhibit 2** for reference. Consequently, Cabot is proposing that monthly sampling with extended purging of the water well be conducted over the next two quarters to allow evaluation of actual formation water conditions, assuming the landowner allows access and proper purging. Further, this well is properly vented according to Department-approved best management practices and poses no threat to persons or property.

- [REDACTED] – The most recent sample, which was split with the Department, was conducted on 7/18/2018 and demonstrated the following: dissolved methane concentration – 16 mg/L and well headspace measurement – 33,780 ppm. This dissolved methane concentration is in-line with the average concentration range over time of 15 to 20 mg/L. Graphic presentations of the dissolved methane and well headspace over time are presented in **Exhibit 2** for reference. While well headspace measurements indicate combustible gas greater than 25% of LEL, this well is properly vented according to Department-approved best management practices and poses no threat to persons or property. For this water supply, Cabot is proposing to conduct additional sampling in coordination with the Department, while Cabot conducts the PBUTs described above.

Ratzel Area Wells (At Background):

- [REDACTED] — Based on the evidence provided in the February 20, 2015 Closure Report and subsequent response to comments “Response to PADEP June 24, 2015 Letter” on November 20, 2015, Cabot believes these water supplies are at background. Nonetheless, Cabot will conduct additional PBUT testing per the above schedule. Following successful completion of these tests, Cabot requests that, as allowed under Paragraph 5.b of the COSA, the Department concur with Cabot’s determination that the concentrations of methane are at background levels for the aquifers that supply these water supplies and requests that the Department approves the cessation of sampling for these water supplies. Graphic presentations of the dissolved methane and well headspace over time are presented in **Exhibit 2** for reference.

No Access (Settlement Agreements):

- [REDACTED] — As described in Section C of your letter, neither Cabot nor the Department have access to the [REDACTED] residences. Settlement agreements with each of these owners state that all claims related to their water supplies have been resolved and settled. Cabot requests that these residences be formally removed from the COSA.

Request #5 – A Spill Remediation Compliance Schedule:

This request is unrelated to the COSA and will be addressed in a separate letter from Cabot that will be submitted contemporaneously with this letter.

Cabot’s Proposal & Closing Remarks

Based on the preceding discussion and supported by the data that has been collected and shared with the Department, Cabot formally requests that the Department issue determination letters indicating the concentration of methane is at the respective background levels for the 12 water supplies identified above. It is also important to communicate these findings to the landowners to bring closure and remove any doubts concerning the quality of their water supplies. To that end, Cabot is willing to work with the Department to the extent the Department would like Cabot’s assistance. Undoubtedly, this would help bolster the credibility of both the Department and Cabot.

Regarding the Dimock/Carter Road Area, Cabot requests that this arbitrary boundary be removed and that Cabot be allowed to resume operations in this area. Years of testing and the resultant data have proven that this area of

limitation if not justified or otherwise supported by the facts. It remains an unwarranted stigma on the Department and Cabot that undermines our respective operations and landowner relations. As Cabot conducts the PBUTs identified above, it is in the best interest of the Department and Cabot to focus on specific gas wells. To the extent an issue is identified, it should be treated as the Department currently addresses such issues – on an individual well basis. Cabot previously discussed this proposal with the Governor's office, the Secretary, and various Department staff, and Cabot was encouraged that the parties appeared receptive to such a targeted and focused approach – one based upon science and measureable data.

Cabot is not waiving its right to object to any determination of the Department, and Cabot expressly reserves the right to challenge any determination made if an enforcement action is undertaken by the Department.

Should the Department wish to meet and discuss any or all of the items covered under this response, Cabot is more than willing to do so.

If you need more information regarding this matter, or have any additional questions, please contact me by telephone at 412-249-3854 or by e-mail at John.Smelko@cabotog.com.

Sincerely,



John J. Smelko

Environmental & Regulatory Compliance Manager – North Region

Cc (electronic copy): Phil Stalnaker (Cabot)
Cole DeLancey (Cabot)
Andy Mehalko (Cabot)

Enclosures: **Exhibit A** – PADEP COSA PowerPoint dated July 17, 2014

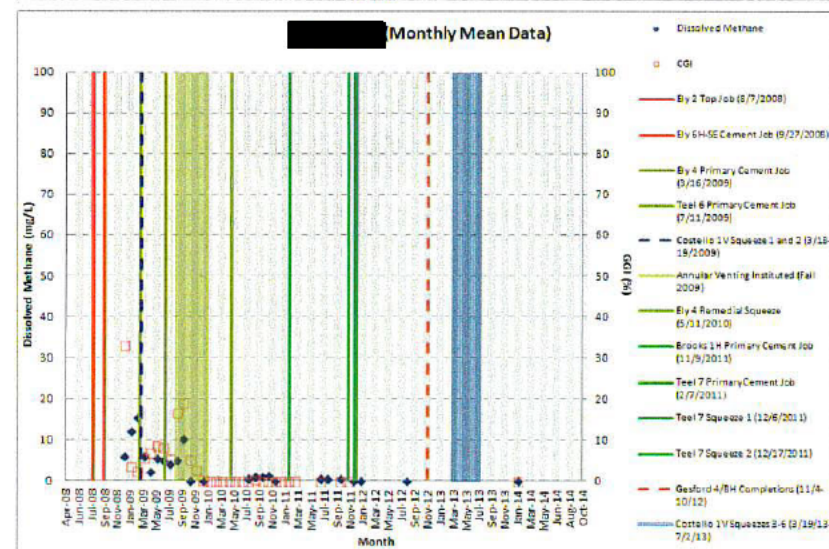
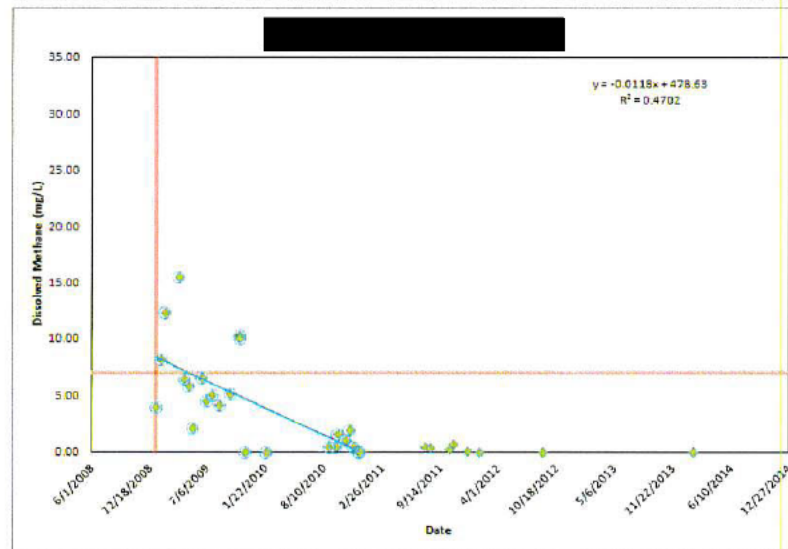
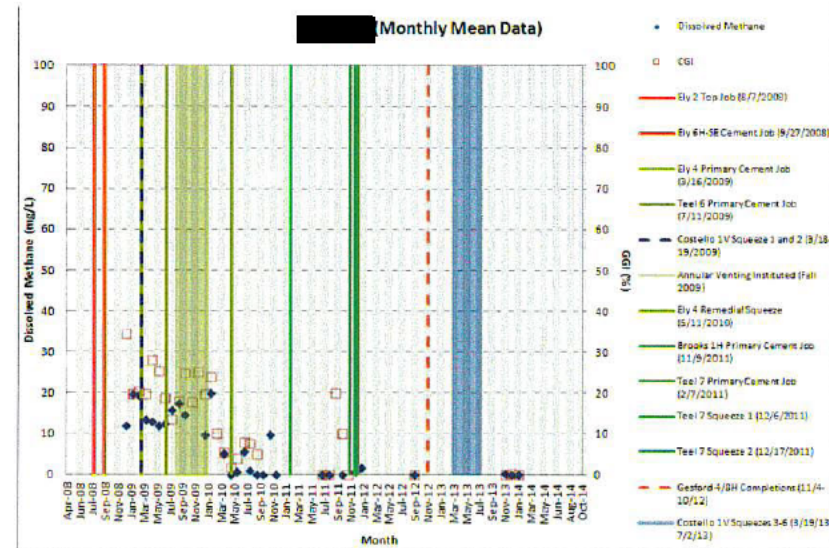
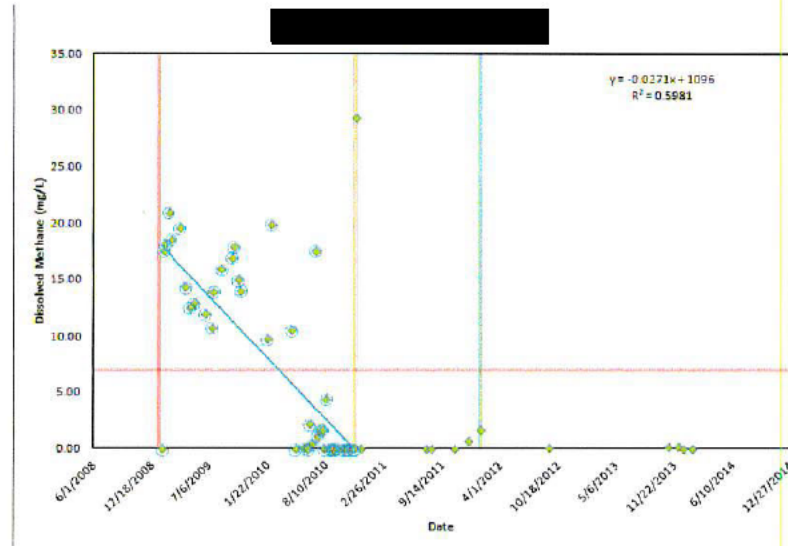
Exhibit B – Resident Time Trend Graphs for Dissolved Methane and Well Headspace

Exhibit A –
PADEP COSA PowerPoint dated July 17, 2014

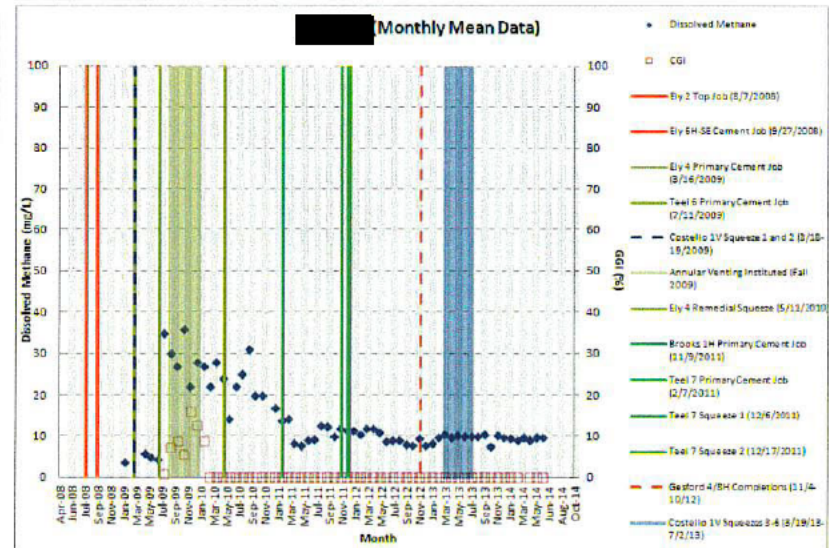
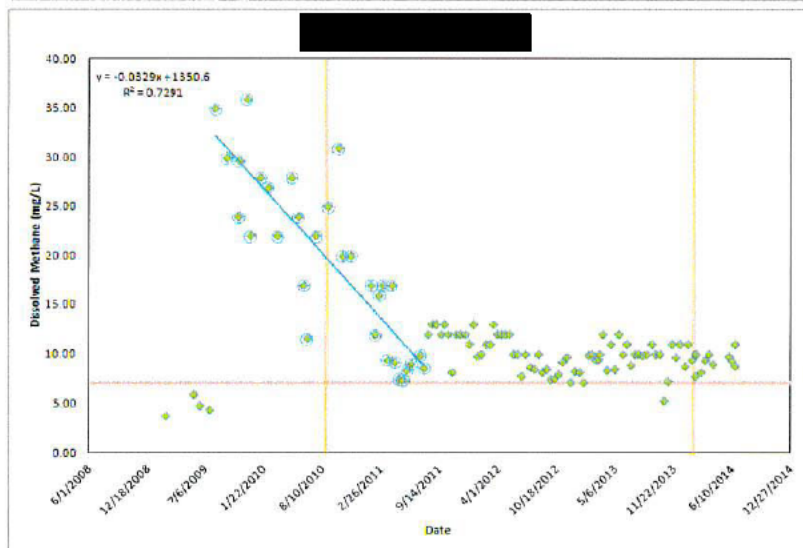
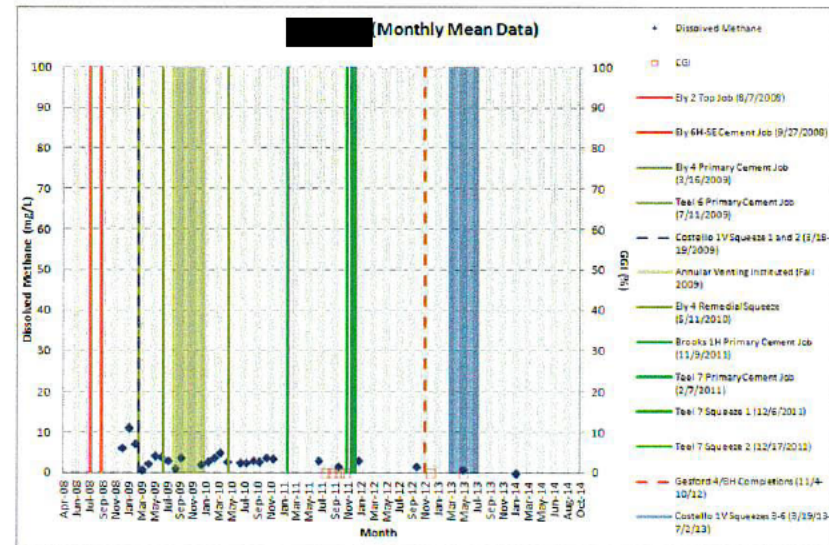
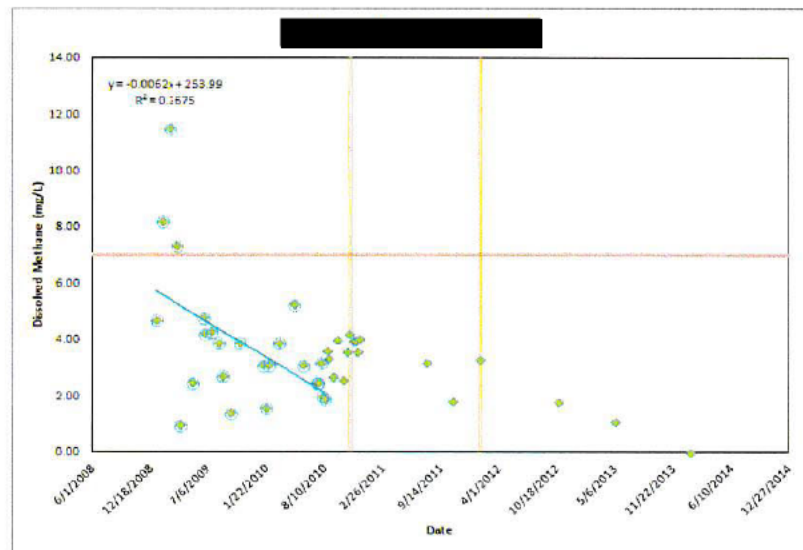
► Presentation Outline

- I. Most Recent Dissolved and Free-Phase Methane Trends
- II. Inter-Laboratory Comparison
- III. DEP and Cabot Split Sampling Results
- IV. Isotopic Interpretation
- V. Ratzel Shut-In Pressure Testing Analysis
- VI. Moving Forward

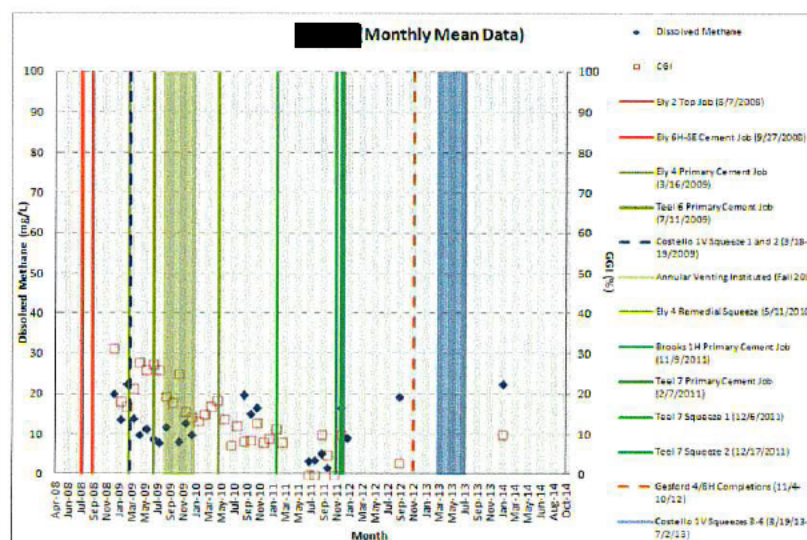
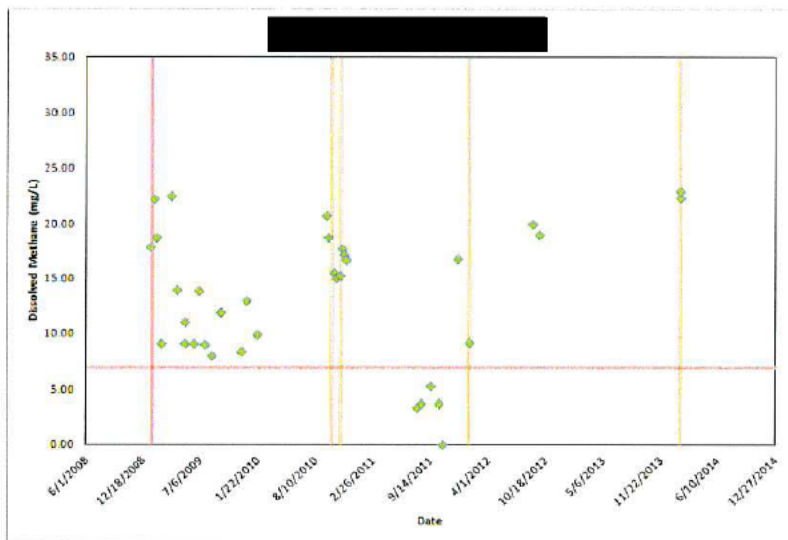
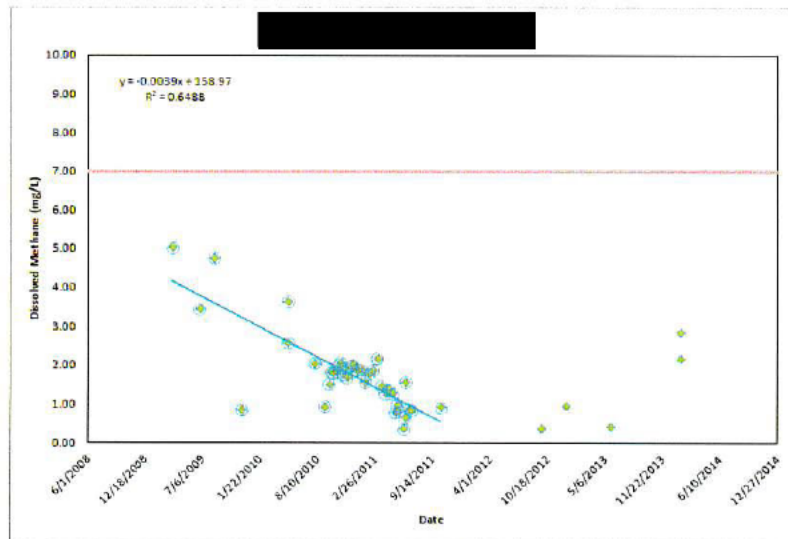
I. Most Recent Dissolved and Free-Phase Methane Trends



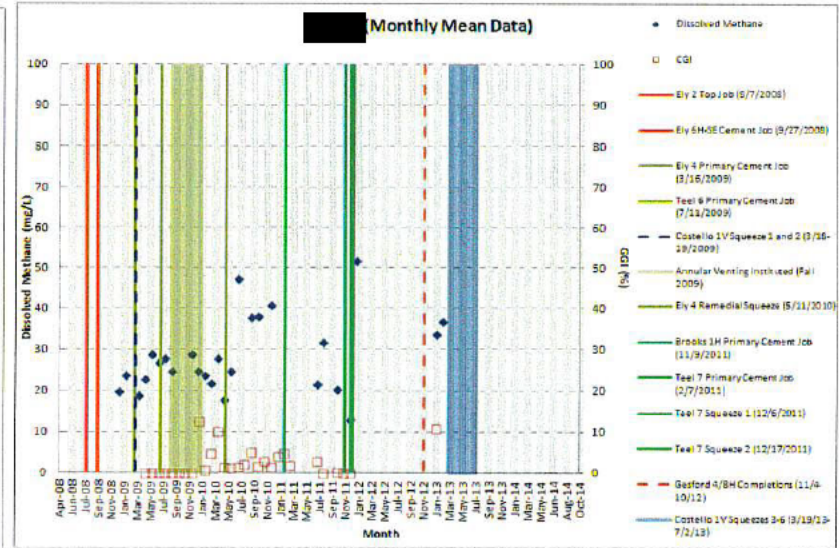
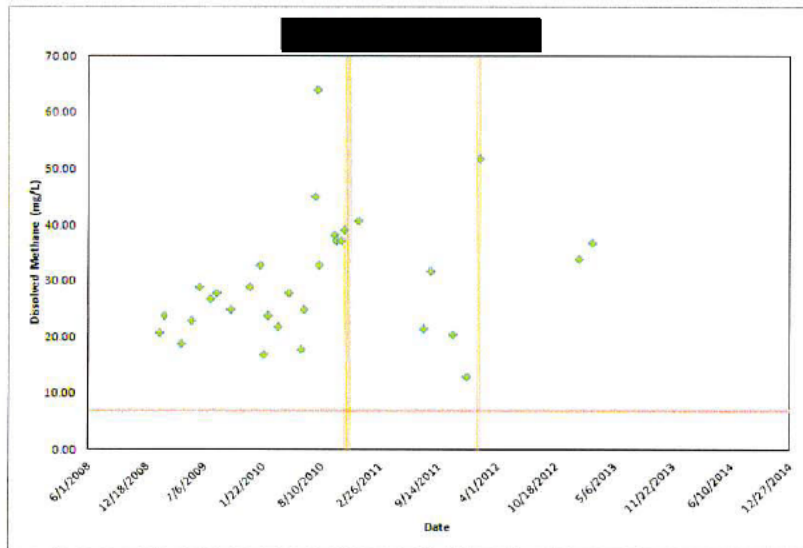
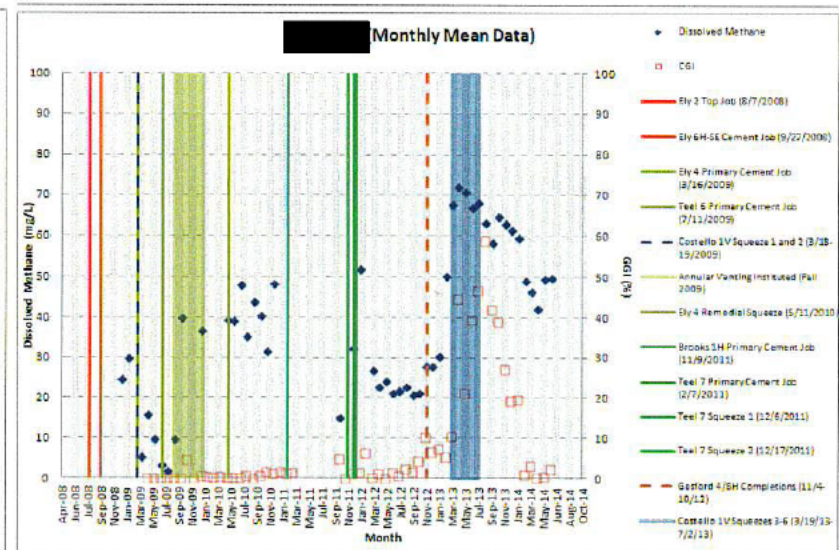
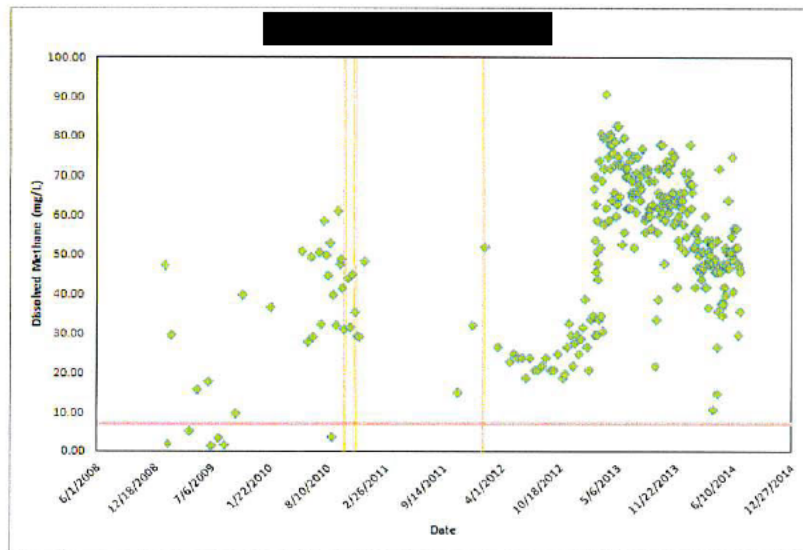
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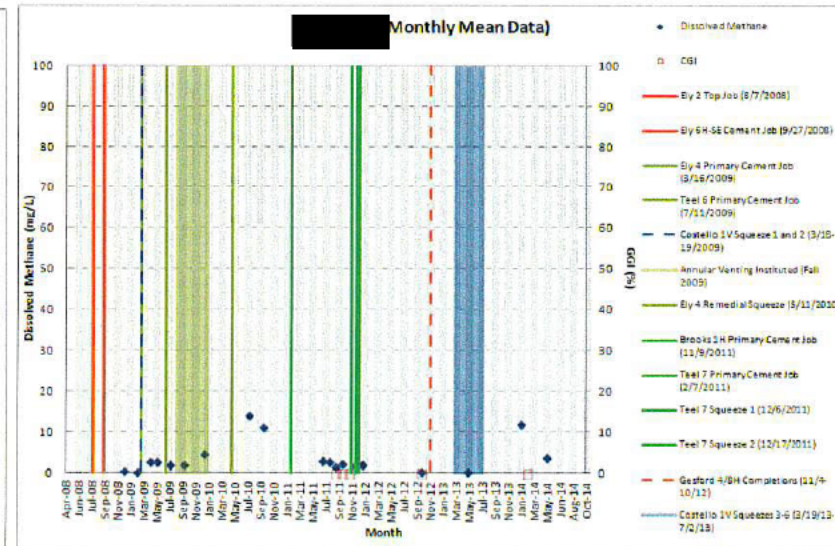
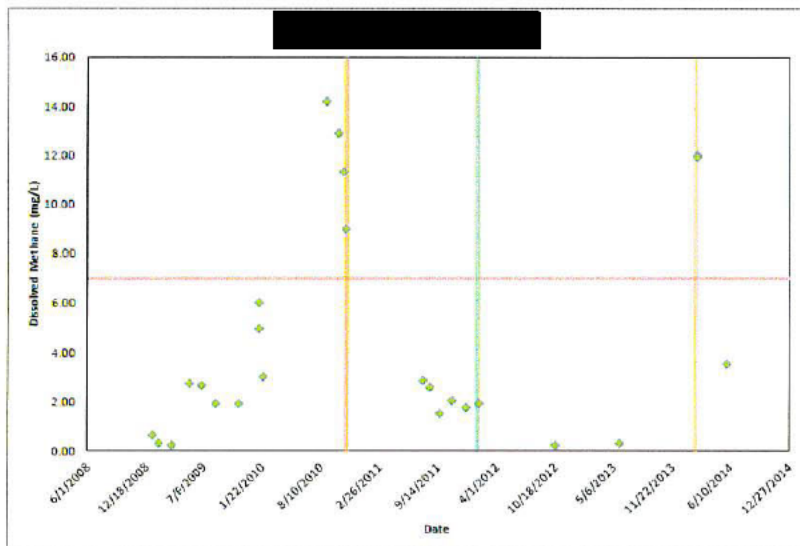
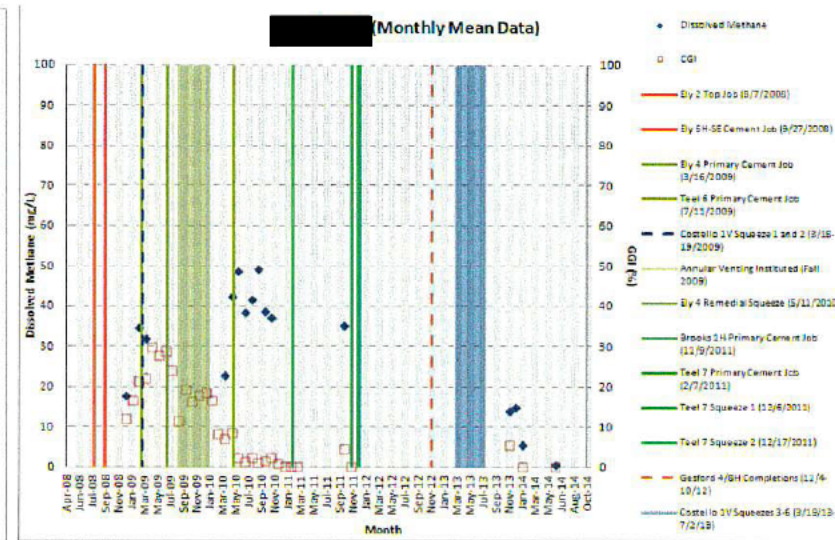
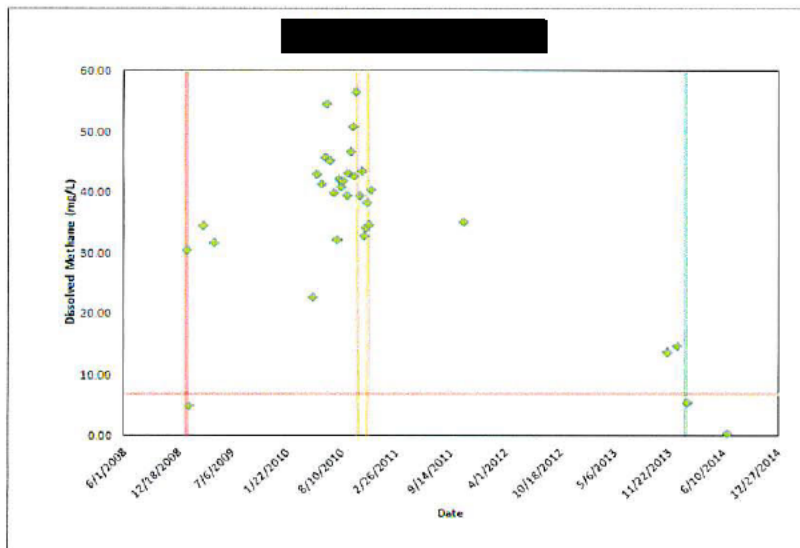
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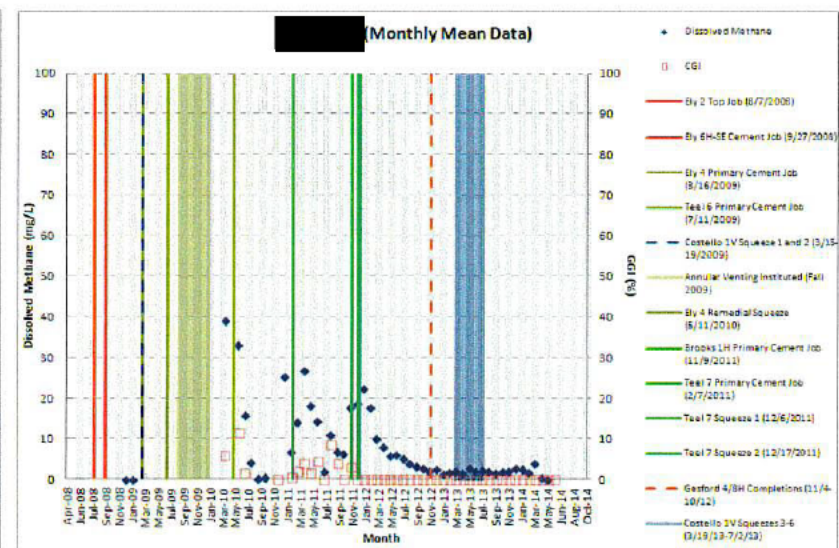
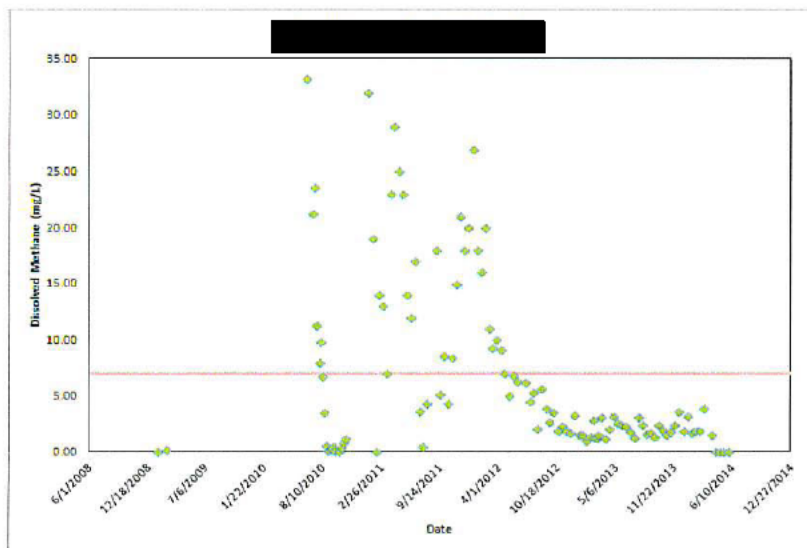
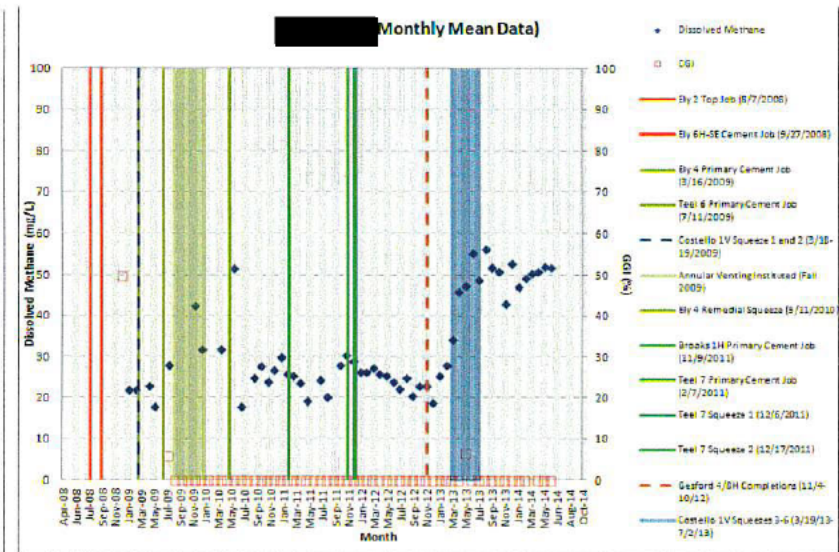
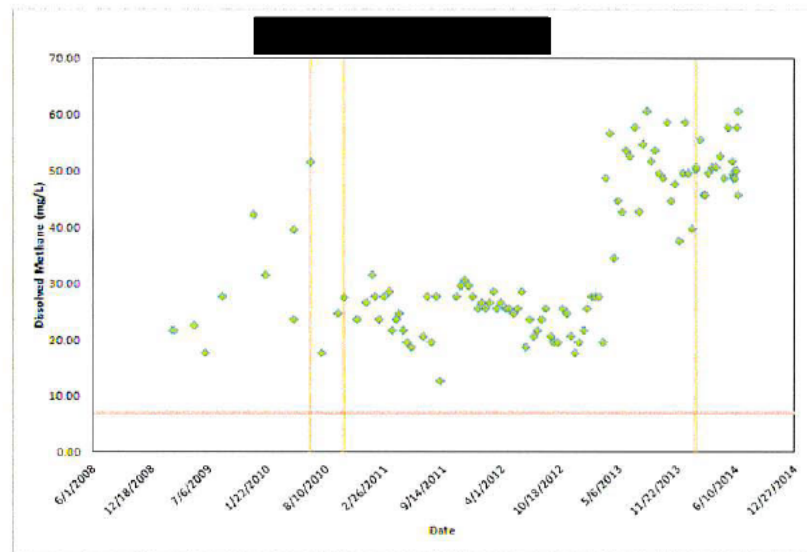
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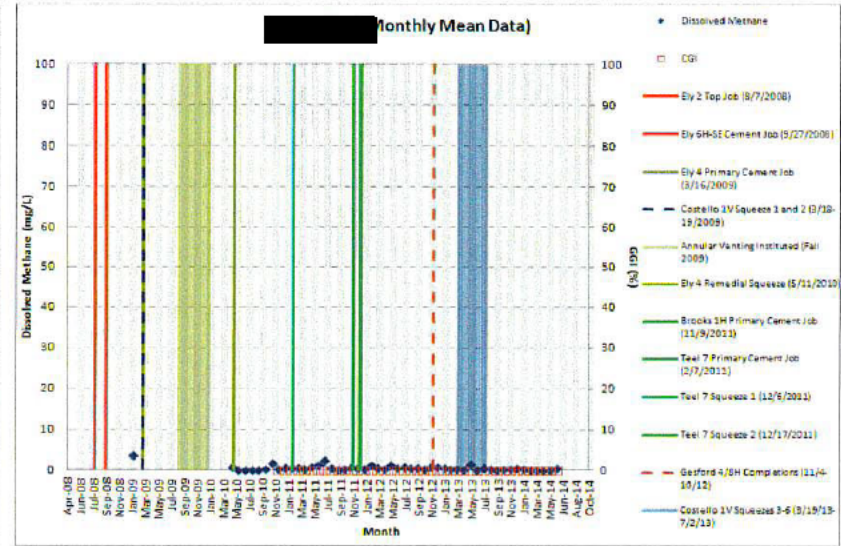
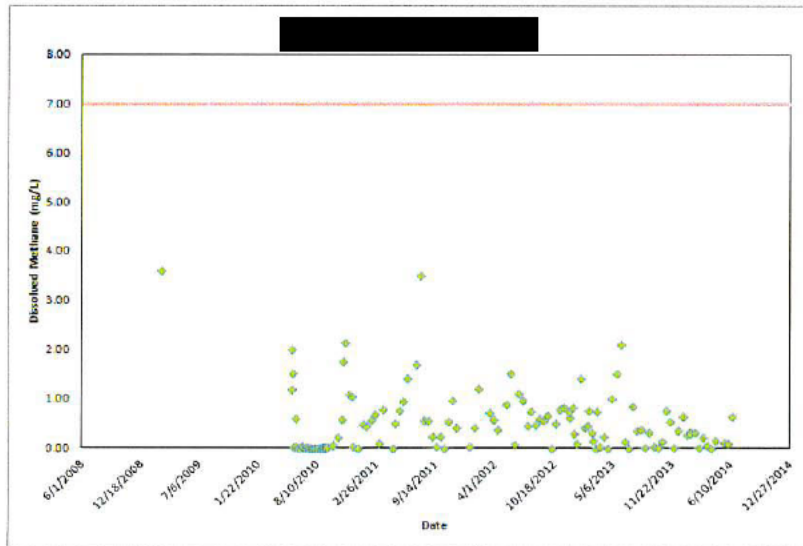
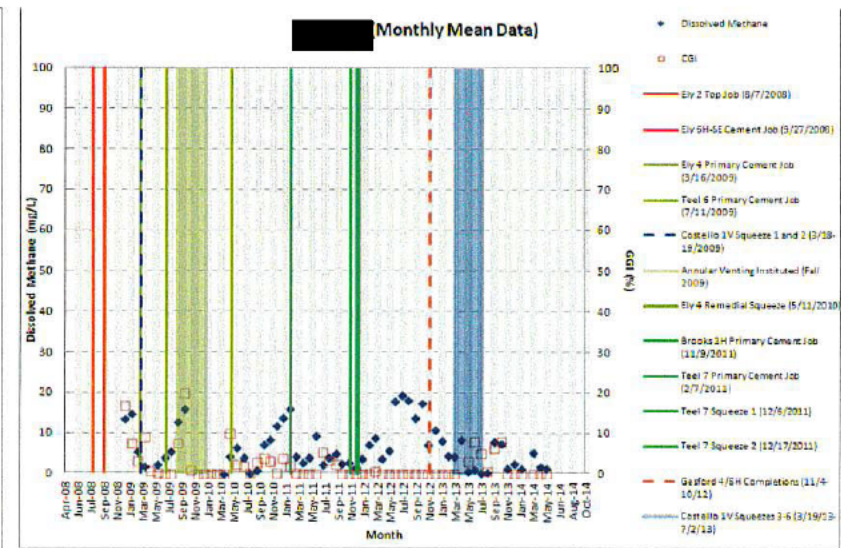
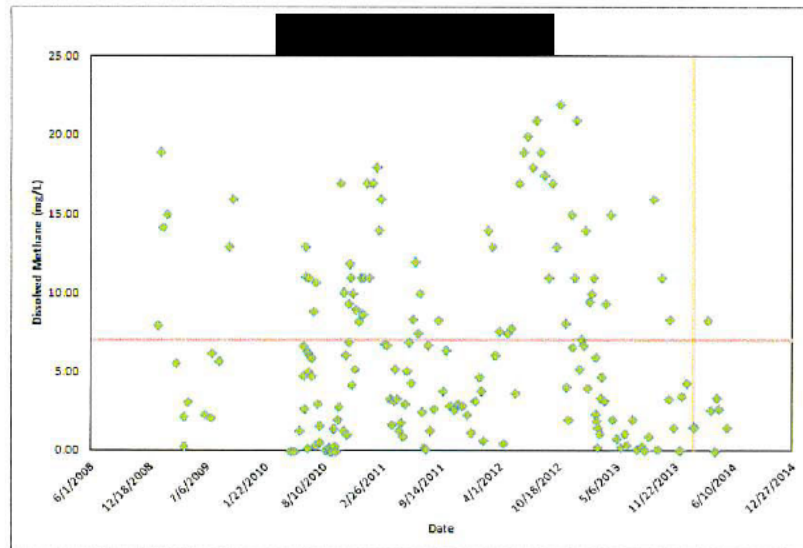
I. Most Recent Dissolved and Free-Phase Methane Trends



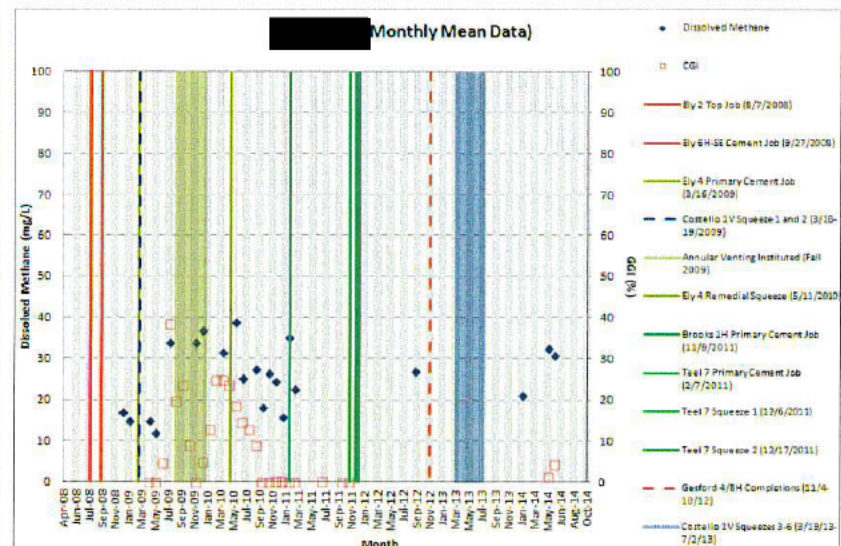
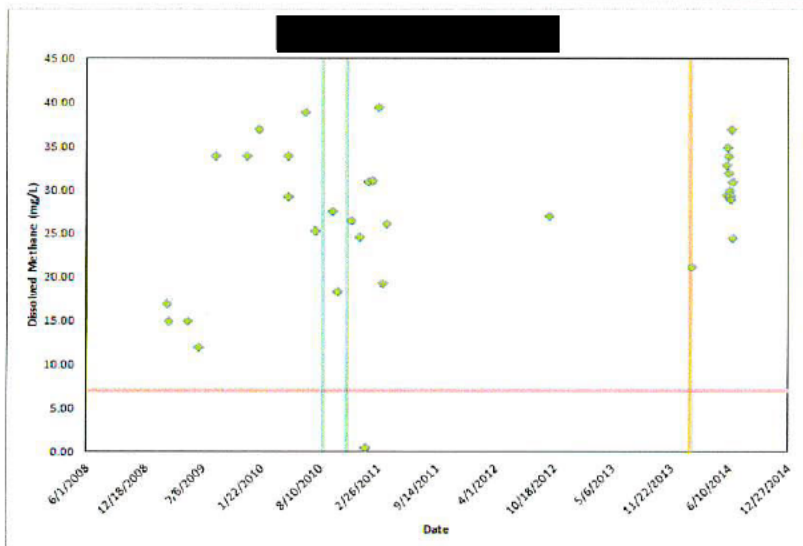
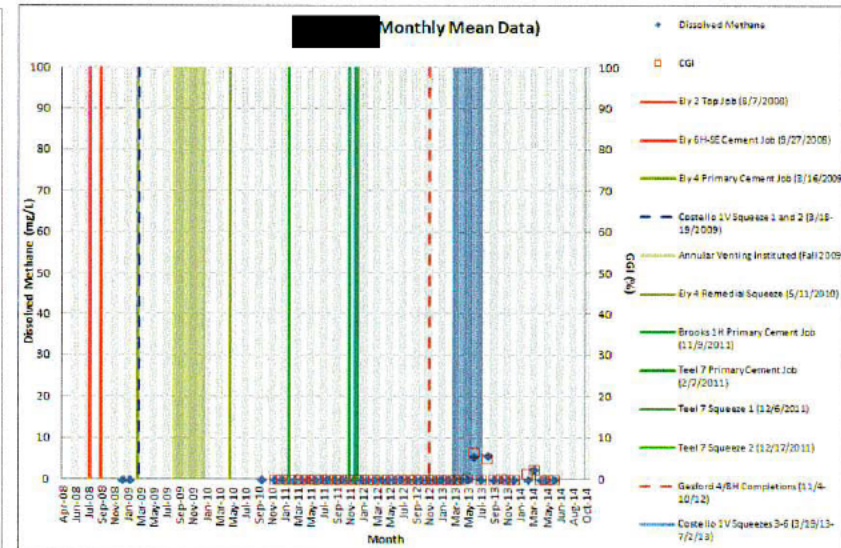
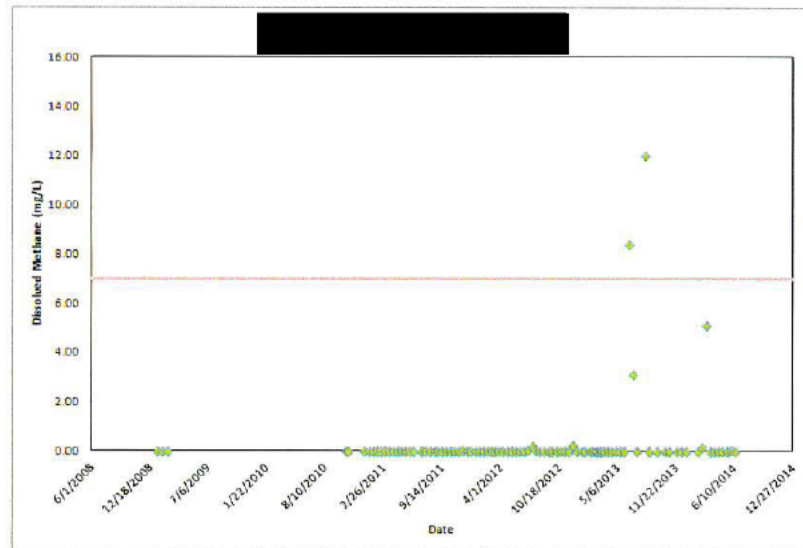
I. Most Recent Dissolved and Free-Phase Methane Trends



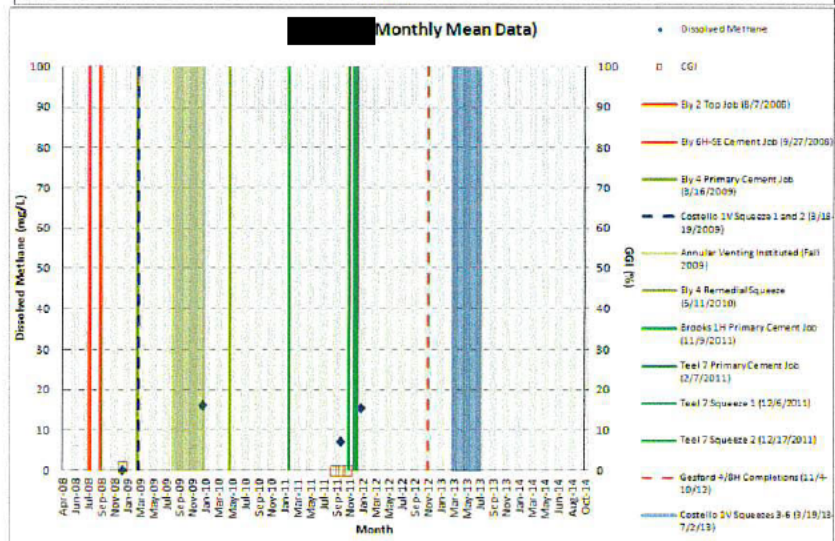
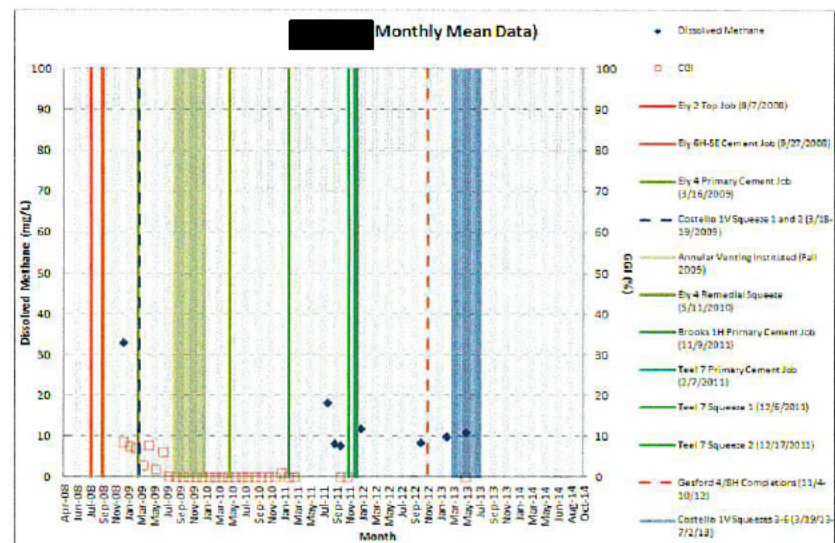
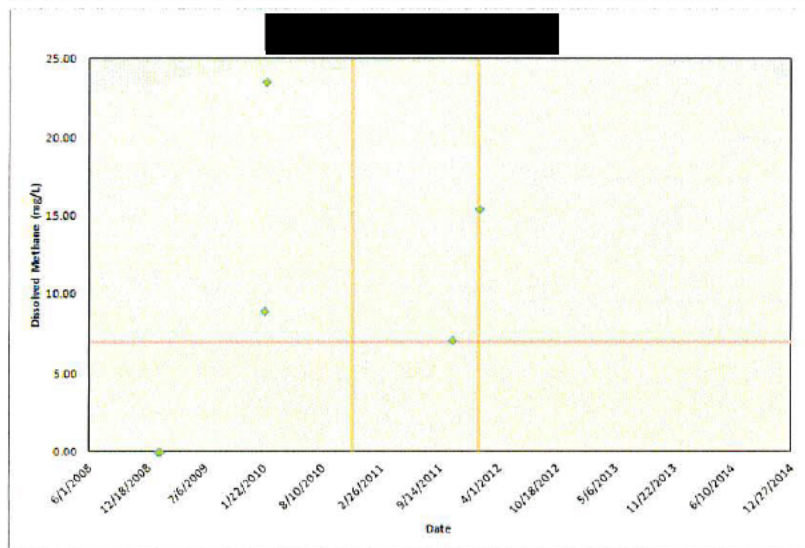
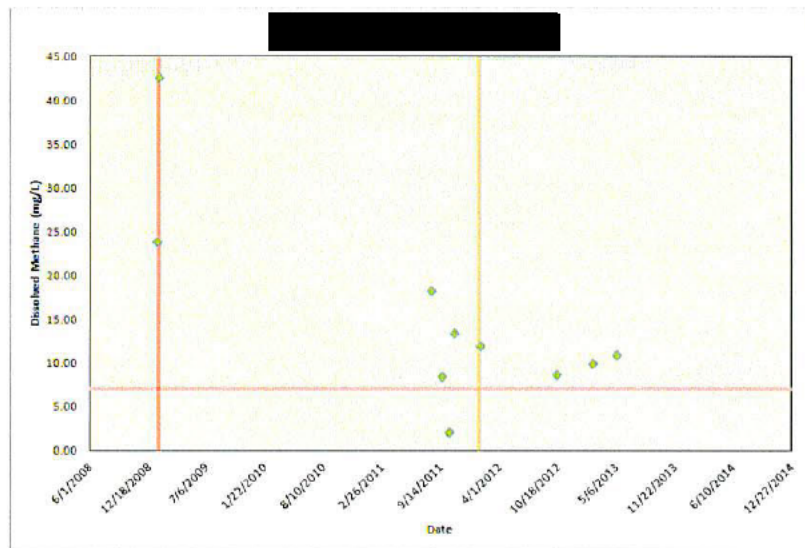
I. Most Recent Dissolved and Free-Phase Methane Trends



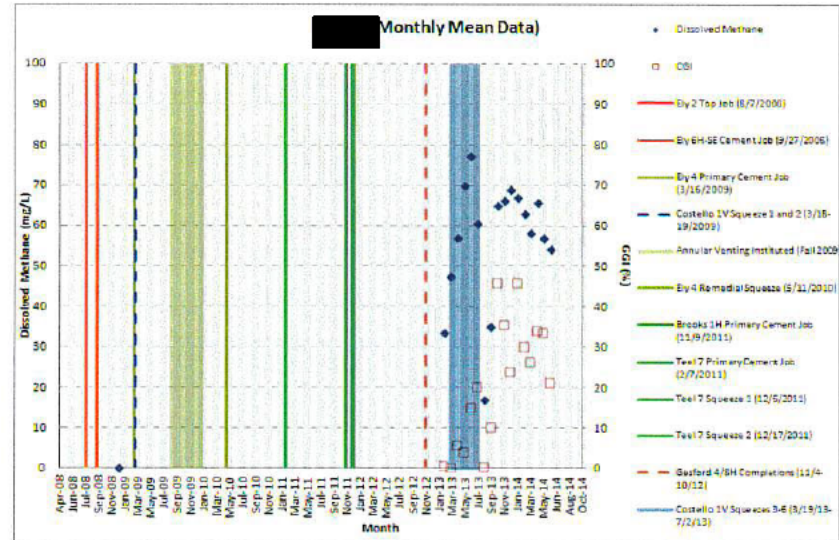
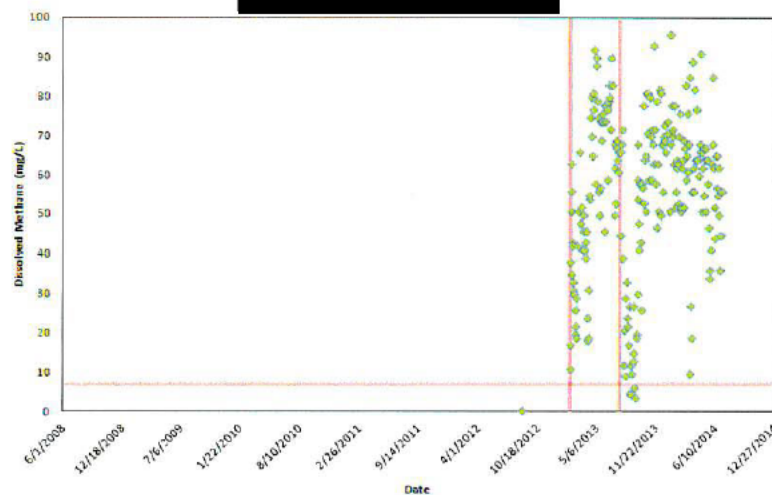
I. Most Recent Dissolved and Free-Phase Methane Trends



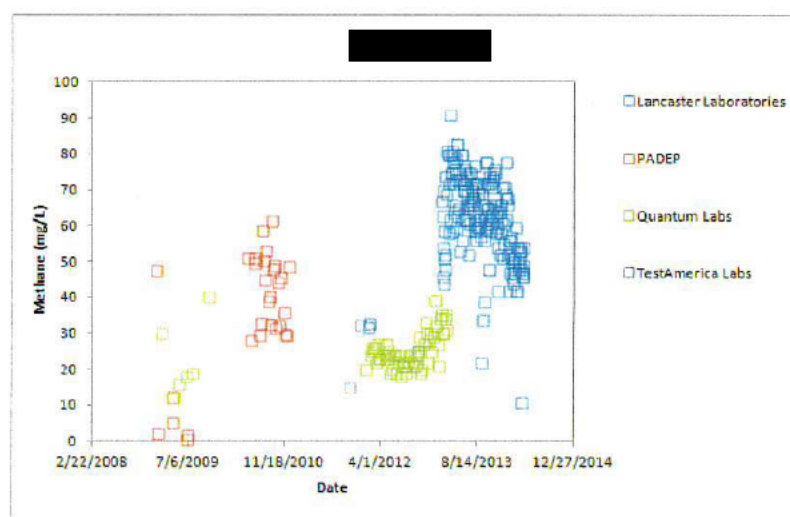
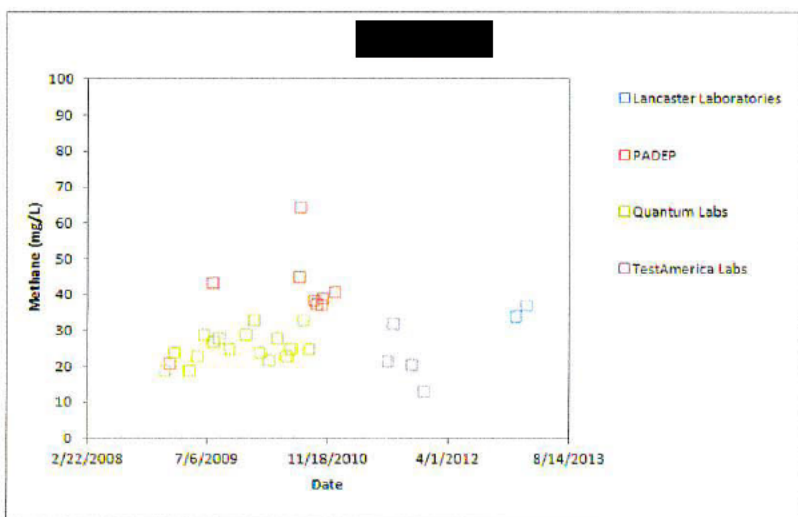
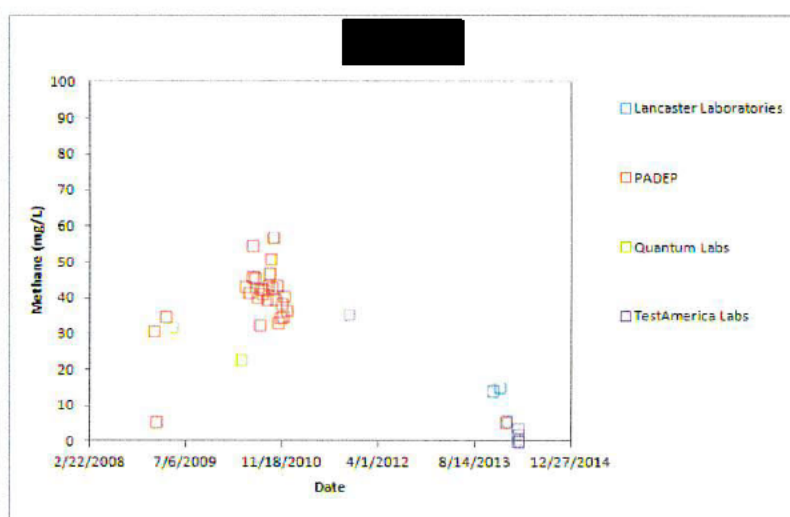
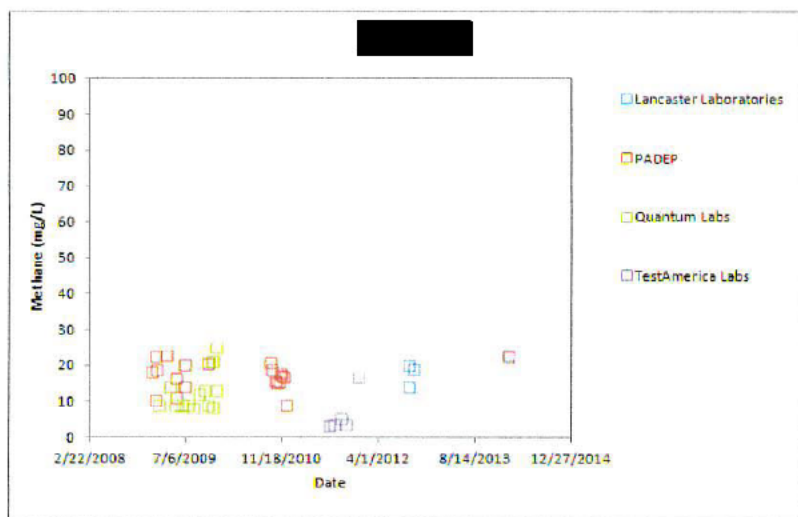
I. Most Recent Dissolved and Free-Phase Methane Trends



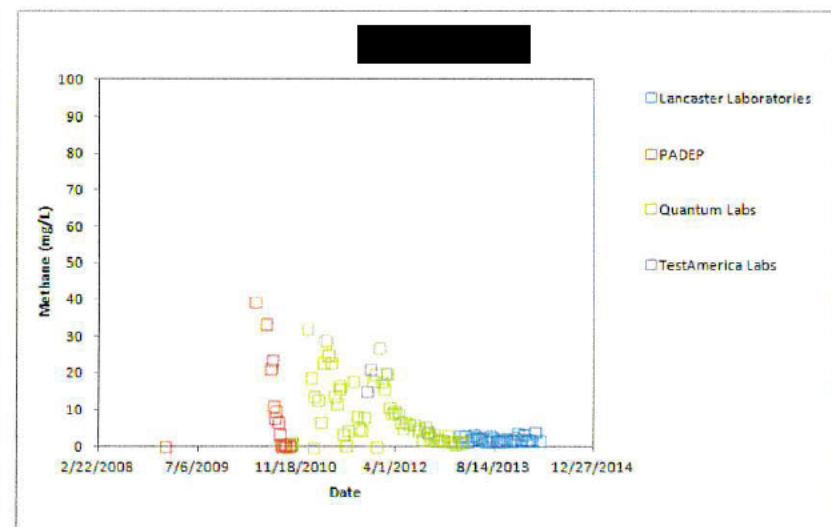
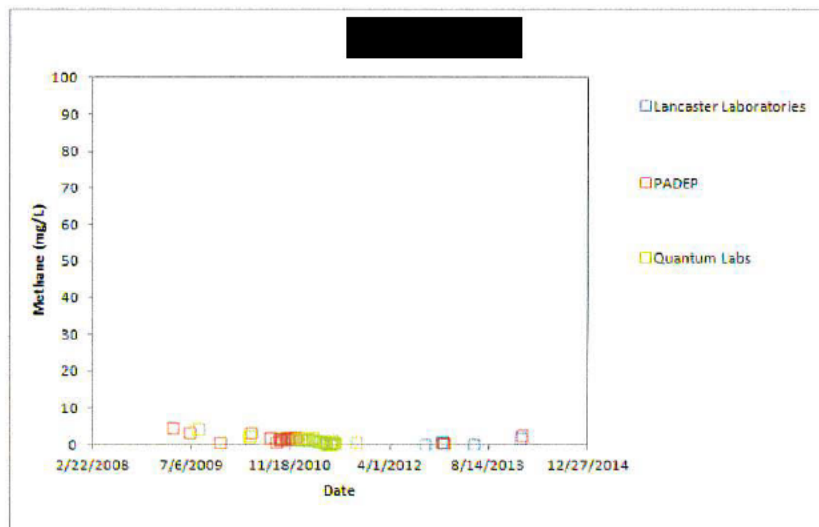
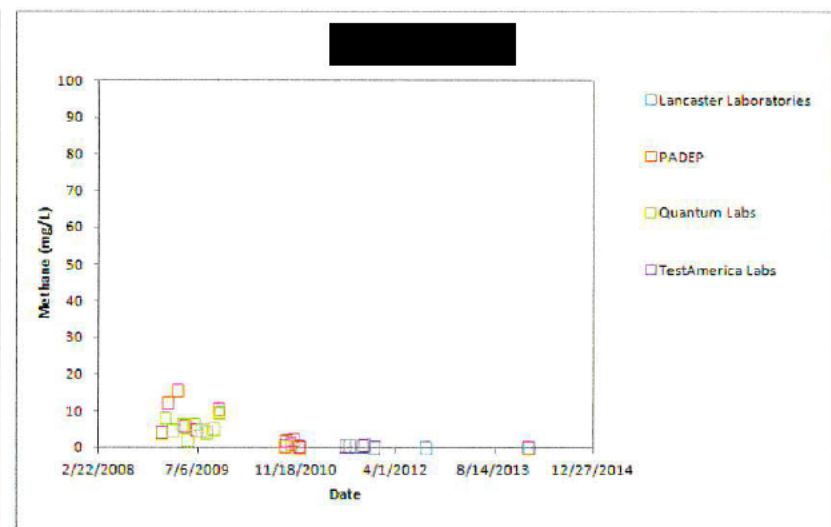
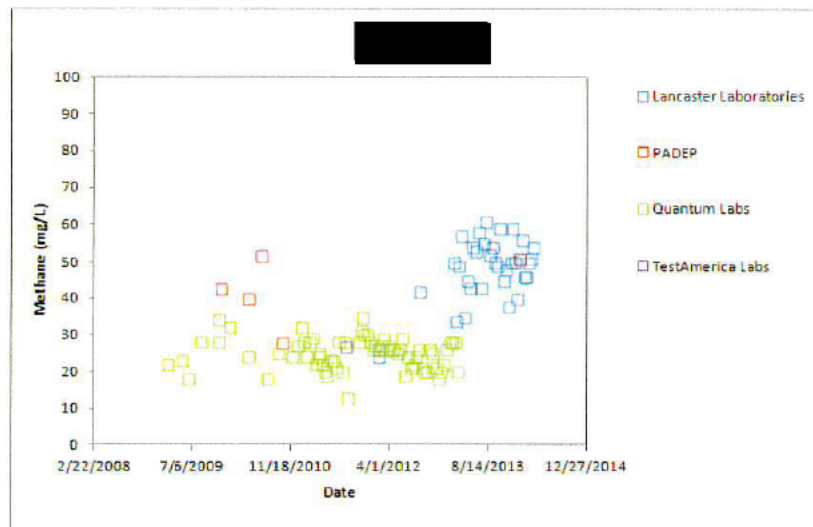
I. Most Recent Dissolved and Free-Phase Methane Trends



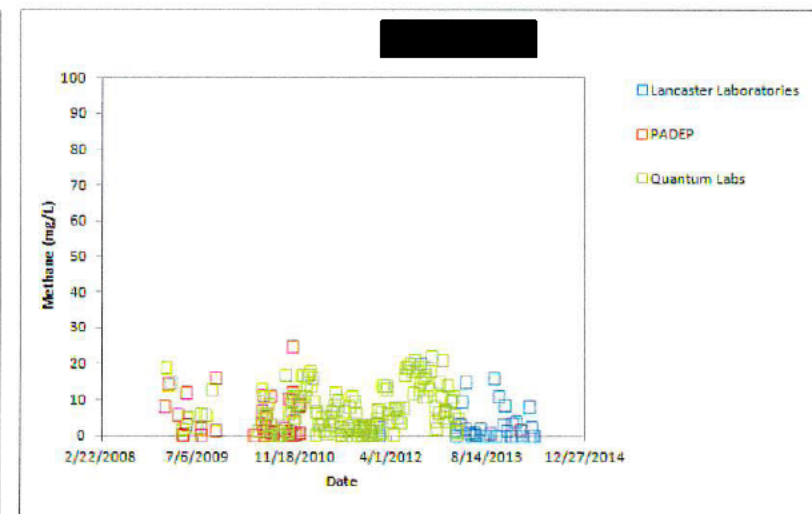
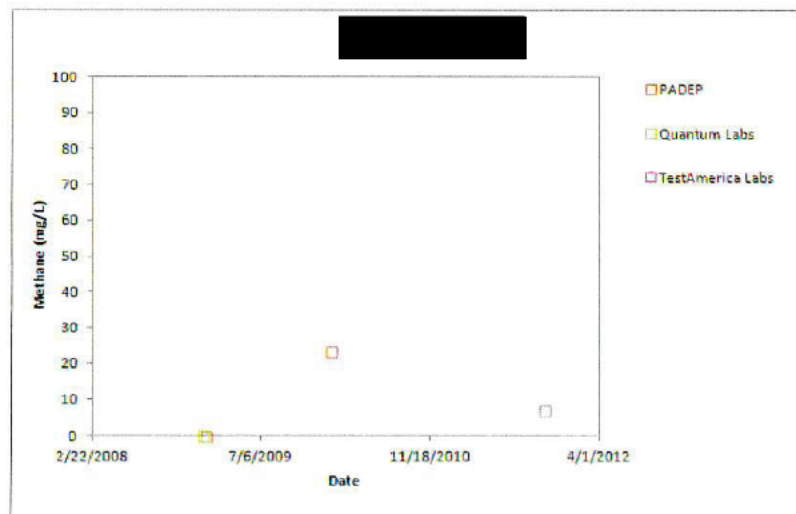
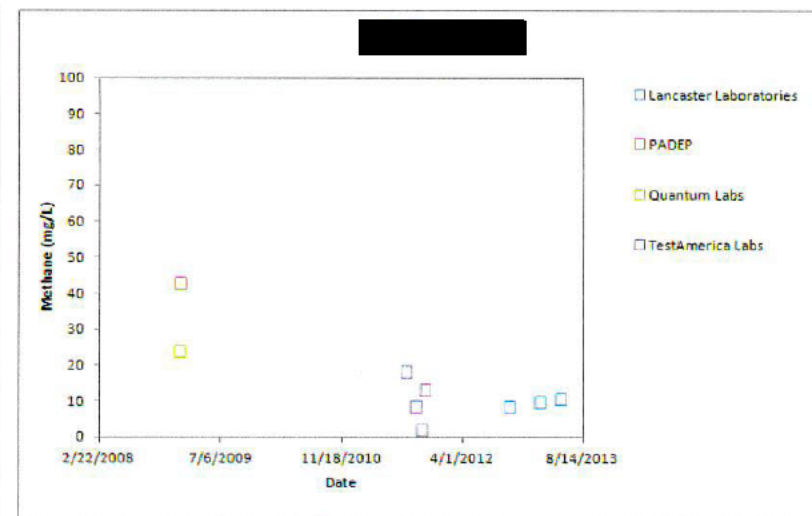
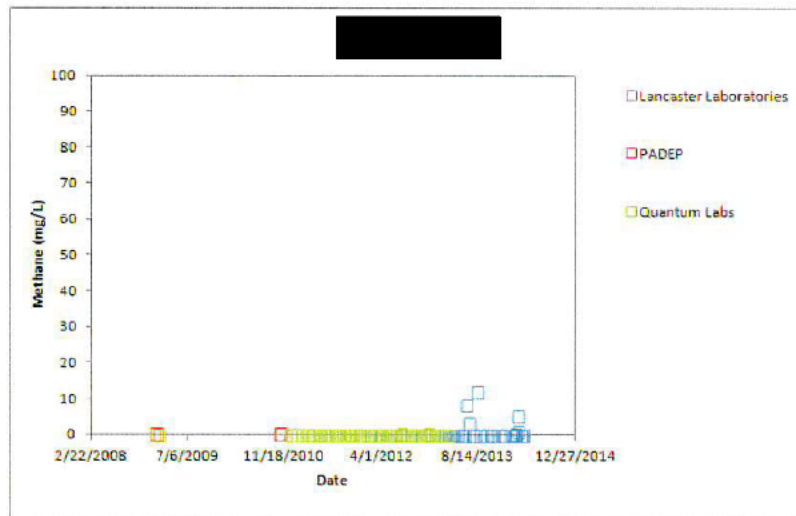
II. Inter-Laboratory Comparison



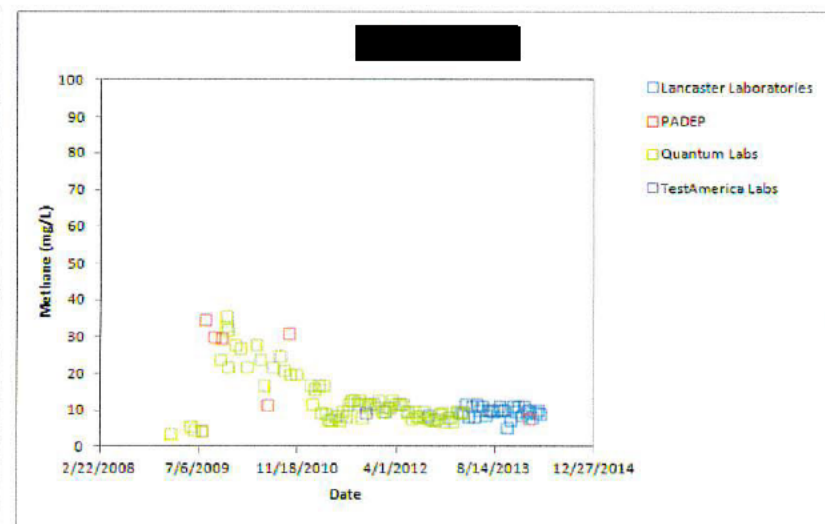
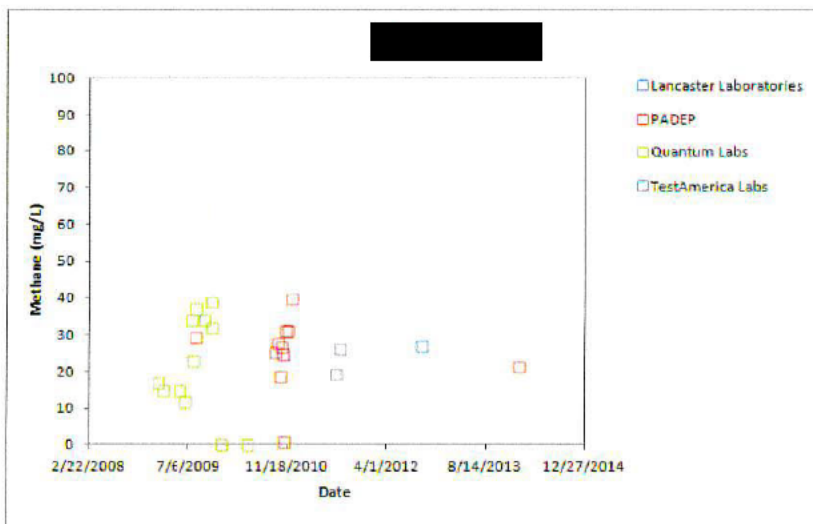
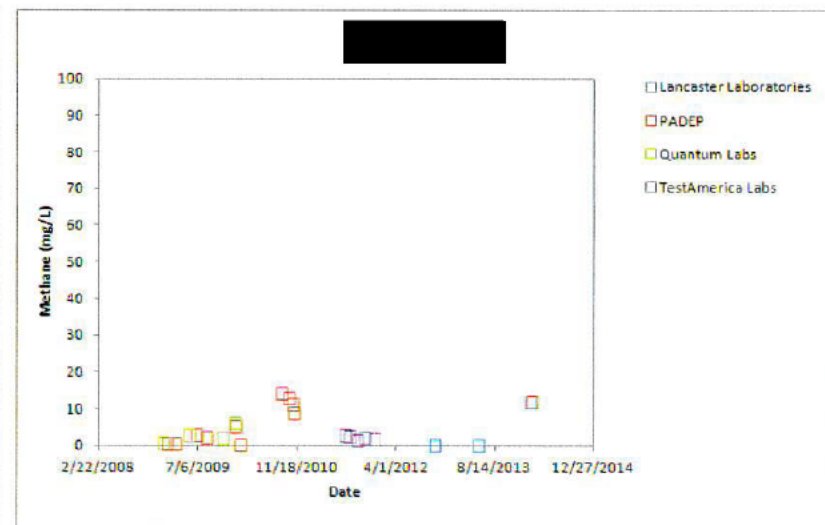
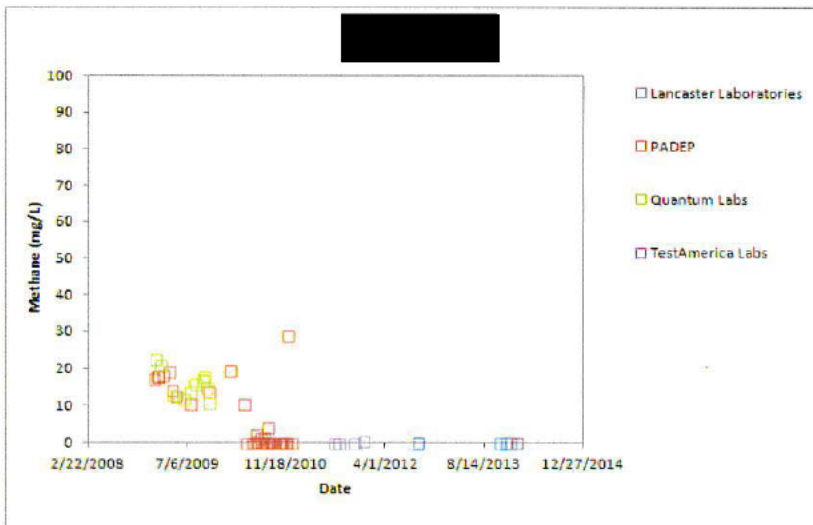
II. Inter-Laboratory Comparison



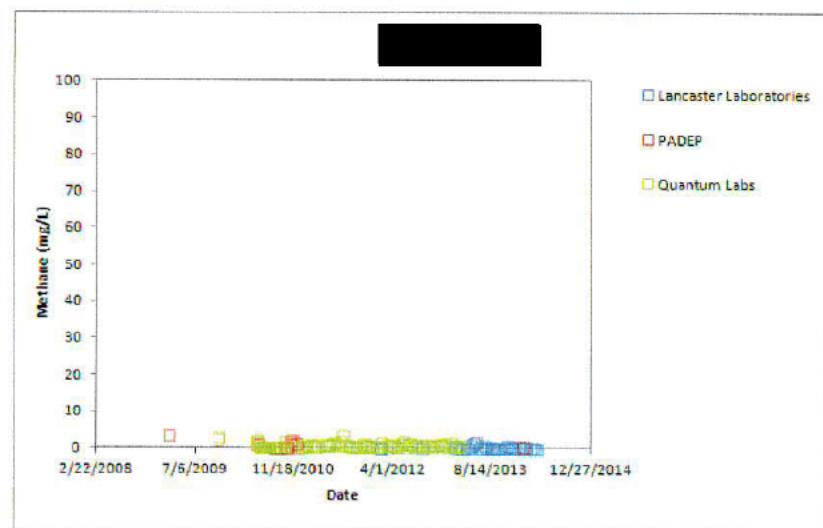
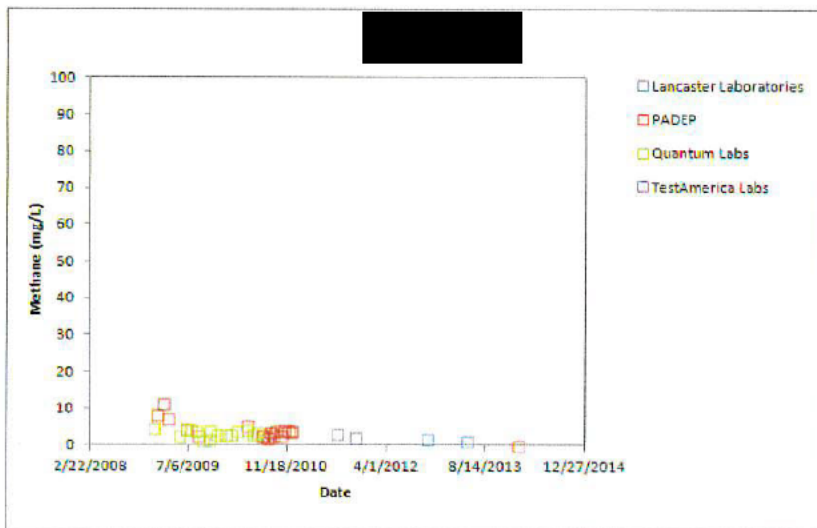
II. Inter-Laboratory Comparison



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II. Inter-Laboratory Comparison

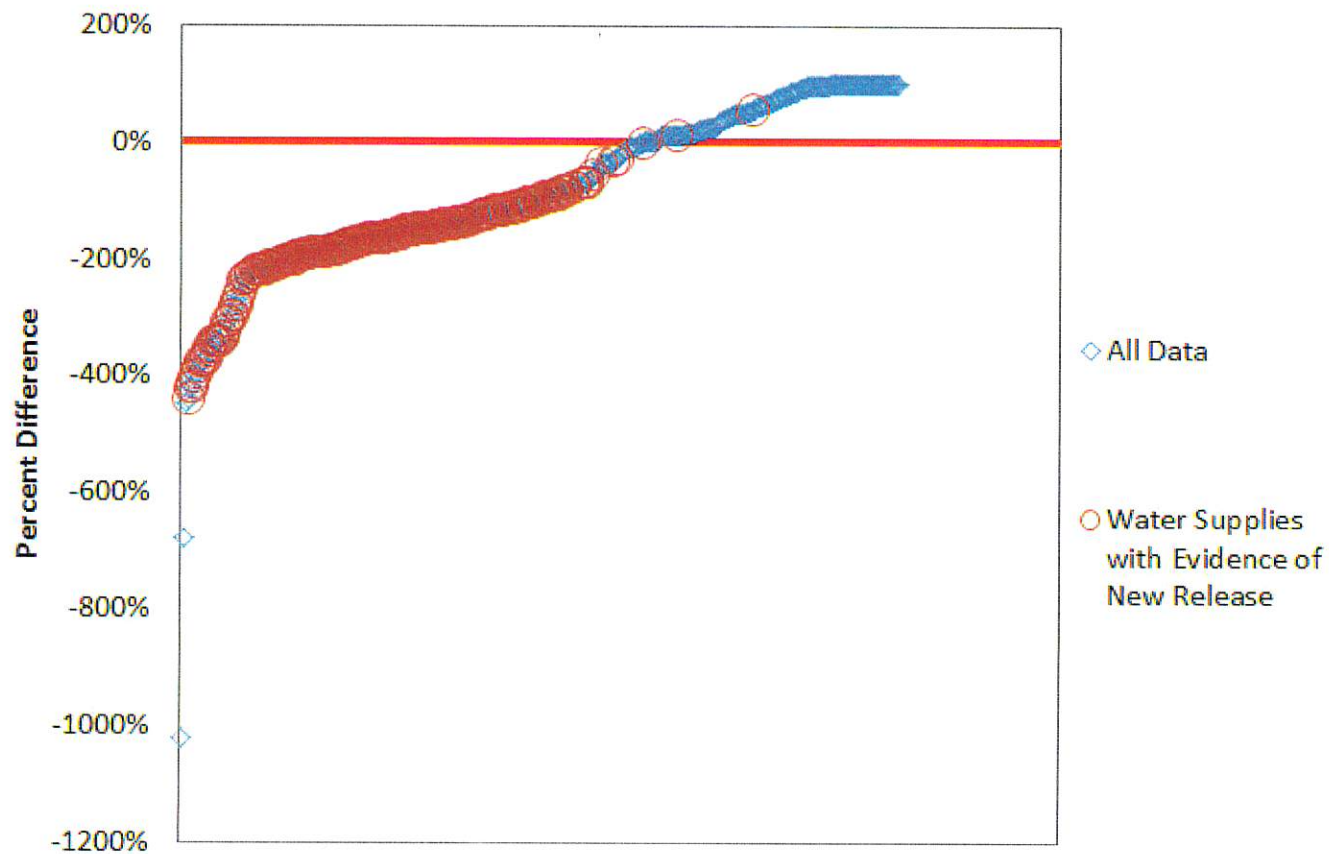


II. Inter-Laboratory Comparison

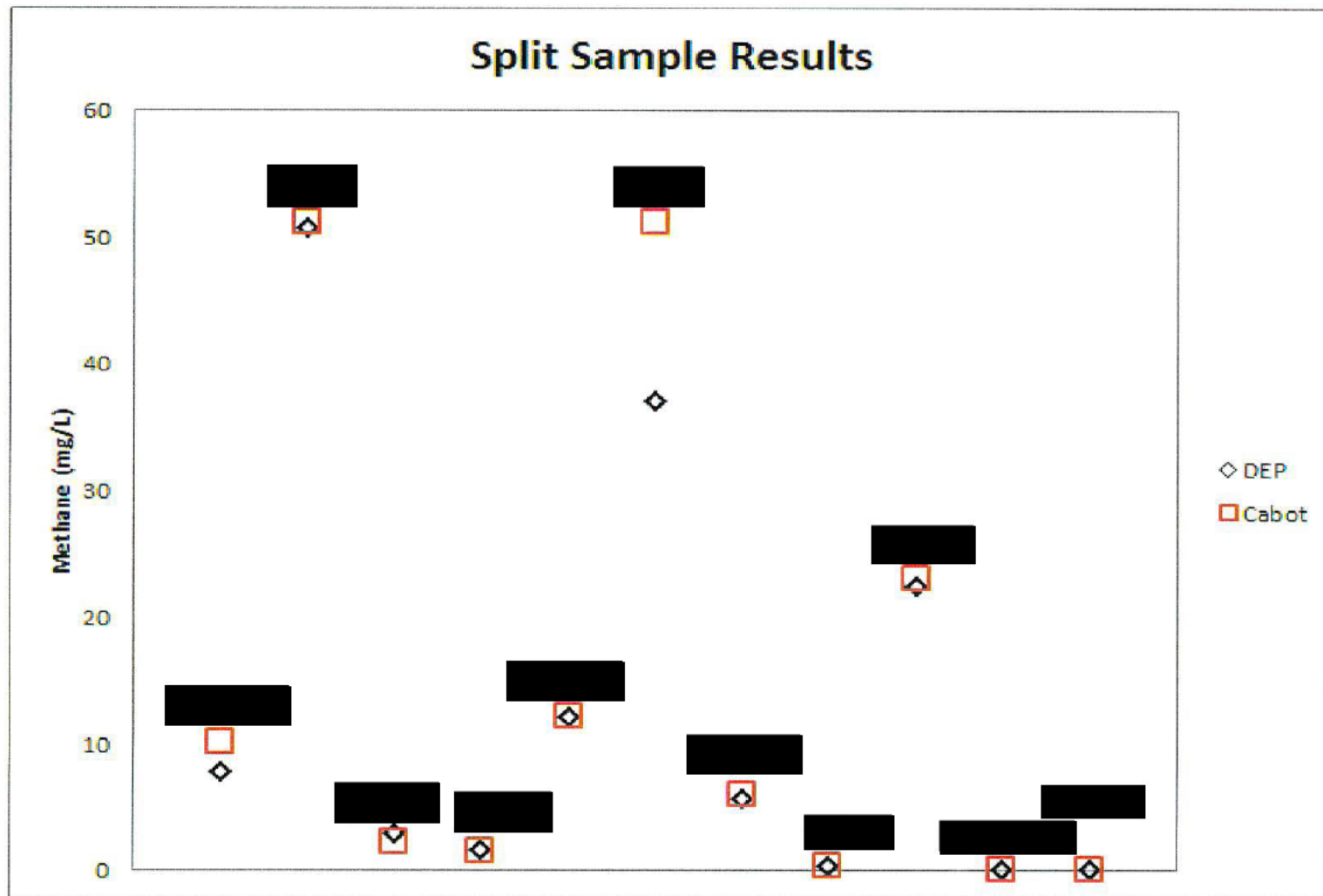
- For select water supplies with significant history of sampling, average concentrations of samples analyzed by Quantum were compared to individual results for Lancaster Laboratories by calculating percent differences: $(\text{Average Result at Quantum} - \text{Lancaster Lab Result}) / \text{Average Result at Quantum} \times 100\%$
- Water supplies (date range) evaluated include [REDACTED] (2/11), [REDACTED] (2/11), [REDACTED] (2/11), [REDACTED] (9/11), [REDACTED] (9/11), [REDACTED] (entire history), [REDACTED] (4/12), [REDACTED] (2/11), [REDACTED] (10/12), [REDACTED] (entire history), [REDACTED] (entire history), and [REDACTED] (entire history)

II. Inter-Laboratory Comparison

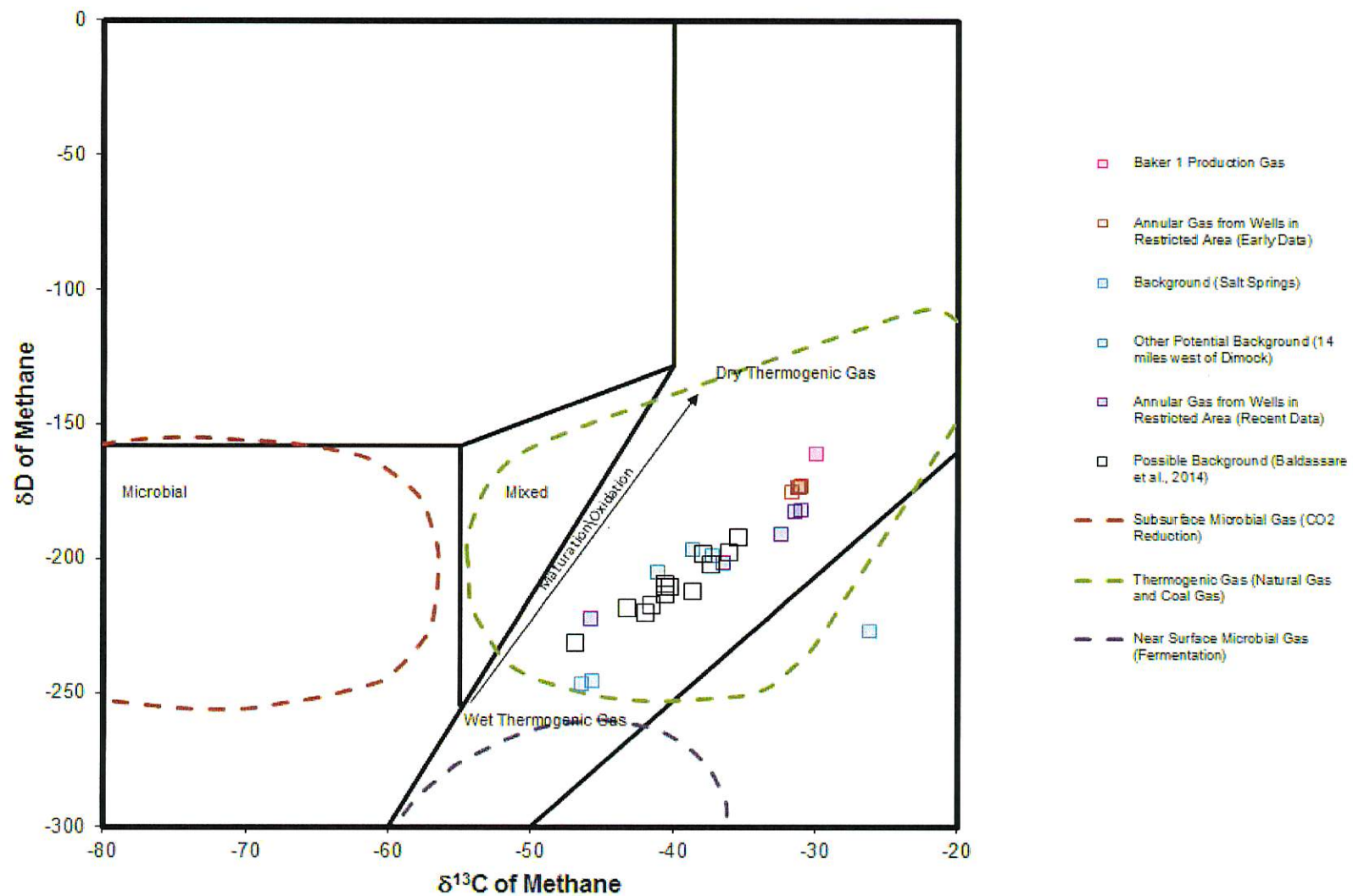
The analysis reveals variability on both sides of the equivalency line and that most situations where the Lancaster Laboratory results were higher are attributable to a suspected new release



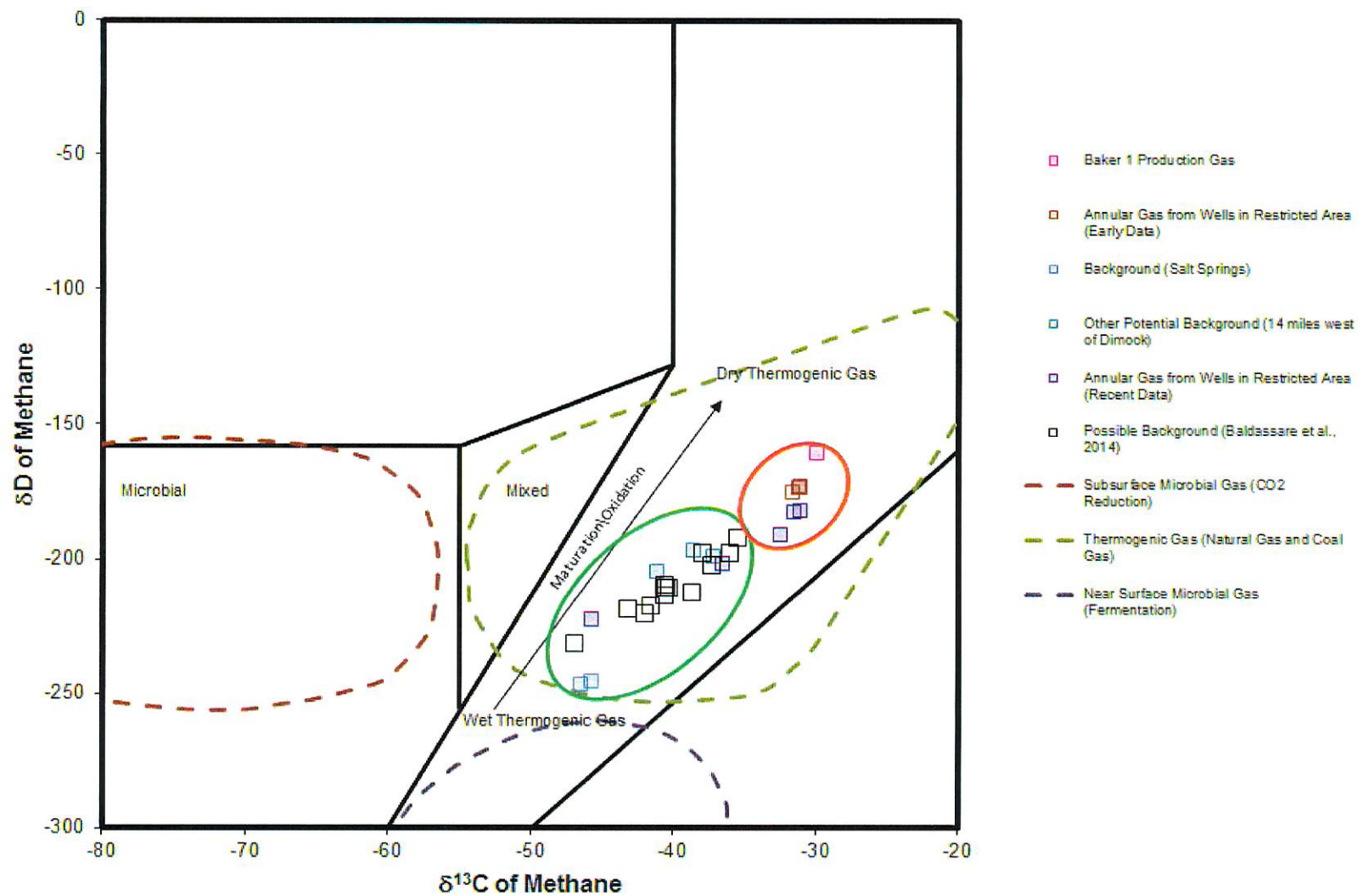
III. DEP and Cabot Split Sampling Results



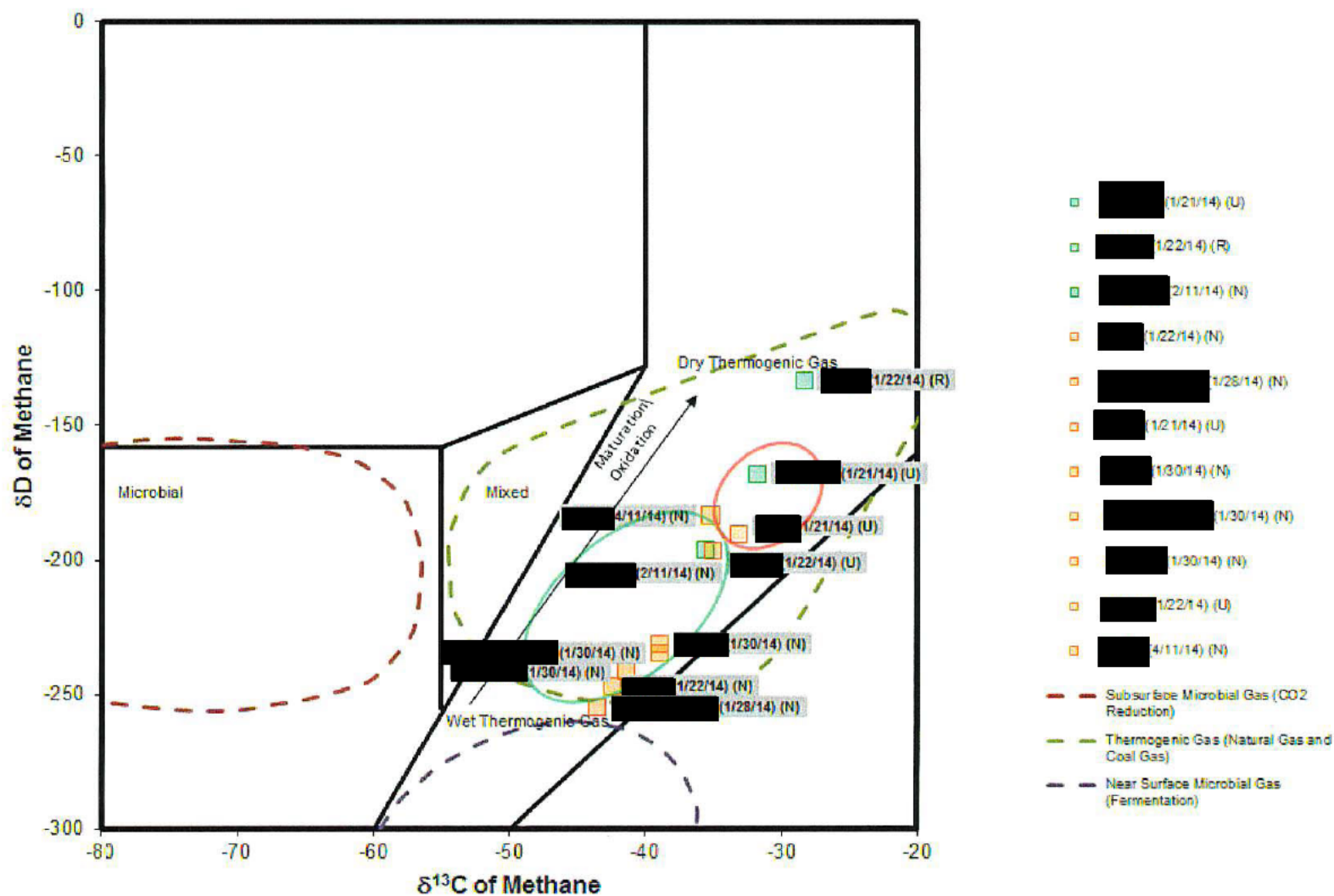
IV. Isotopic Interpretation



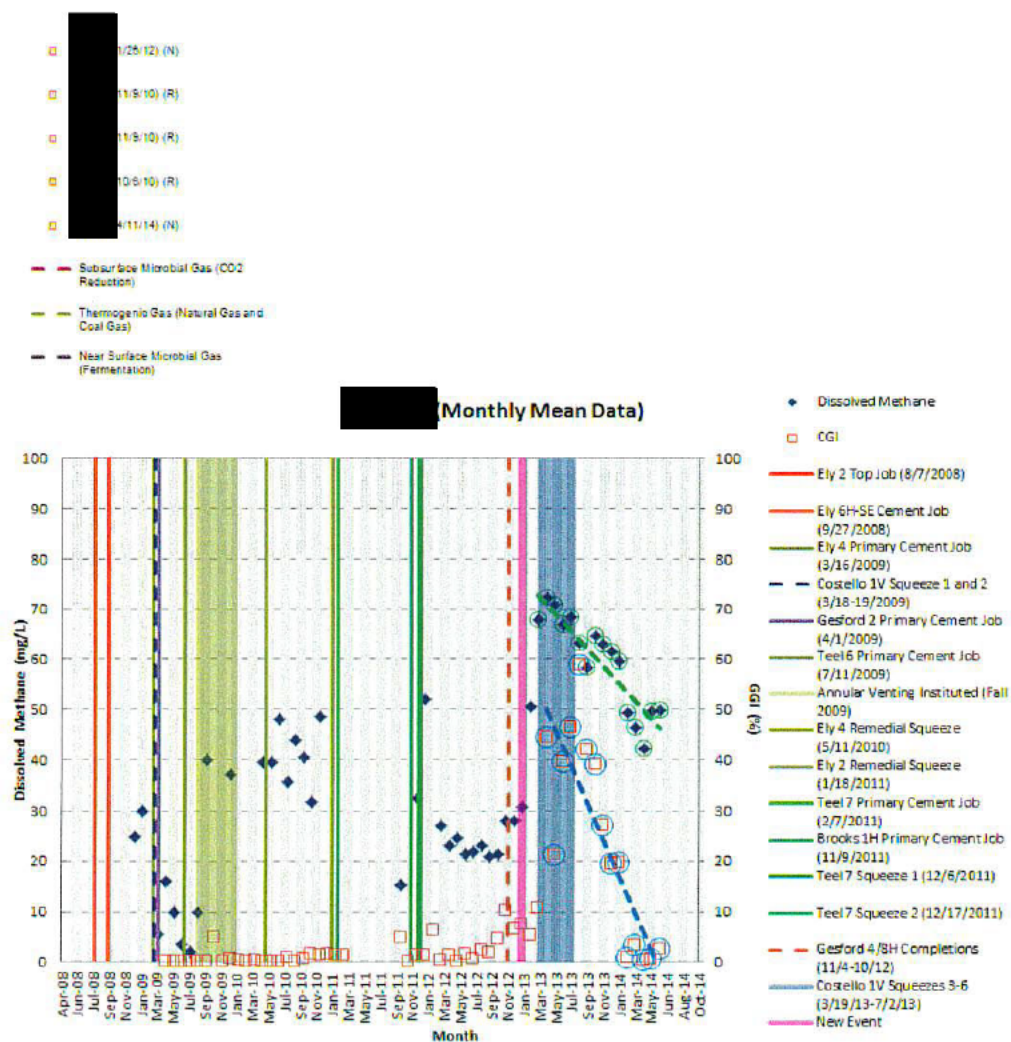
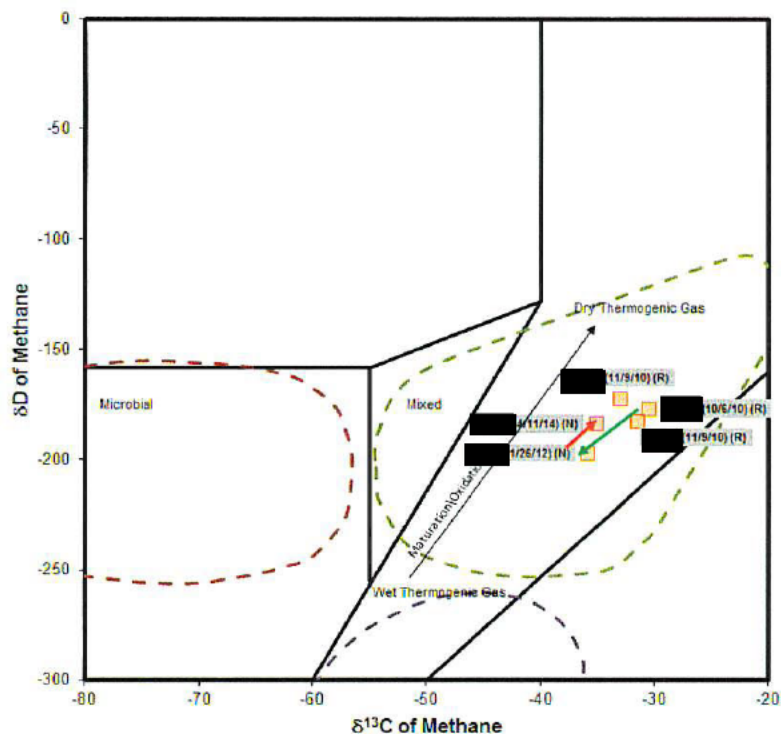
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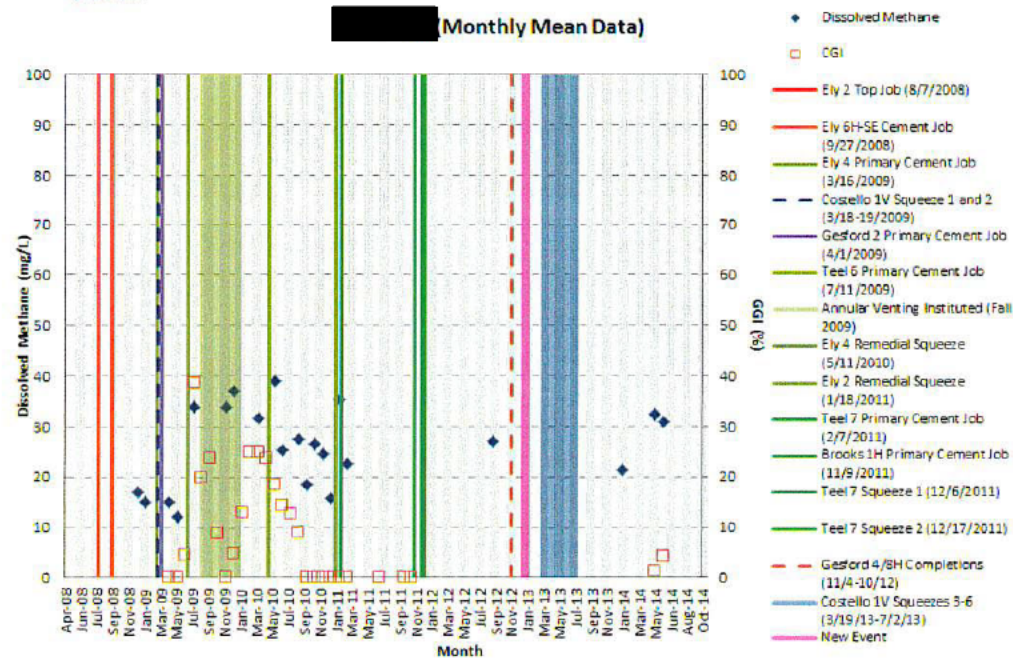
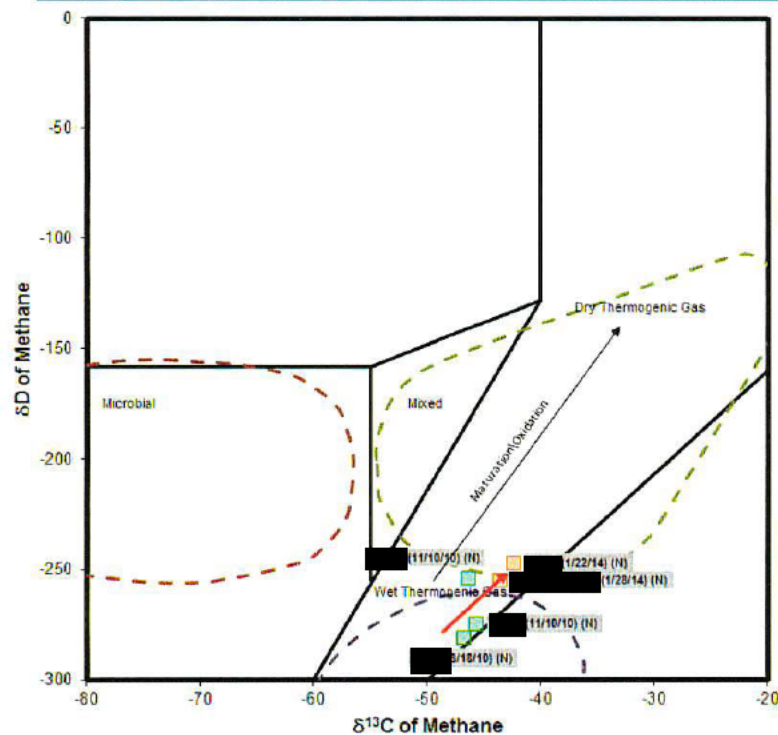
IV. Isotopic Interpretation



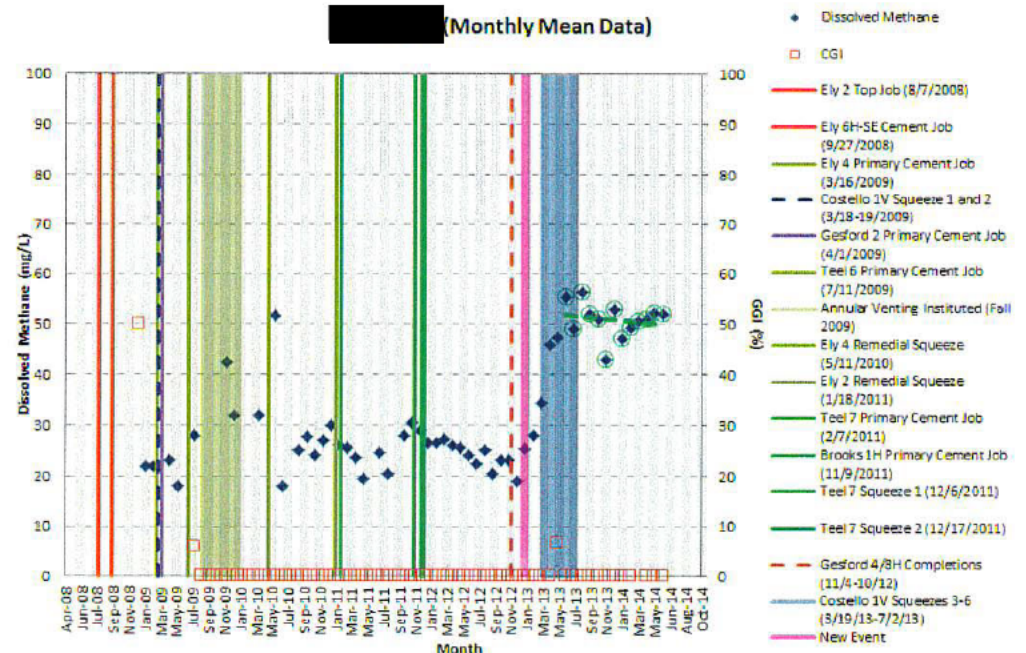
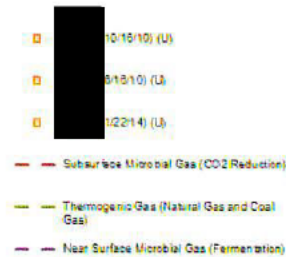
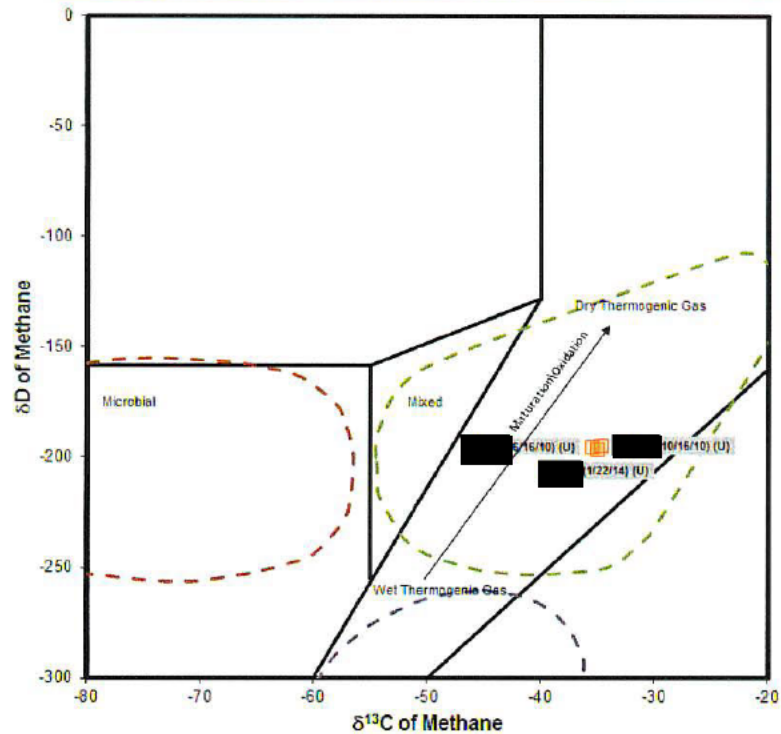
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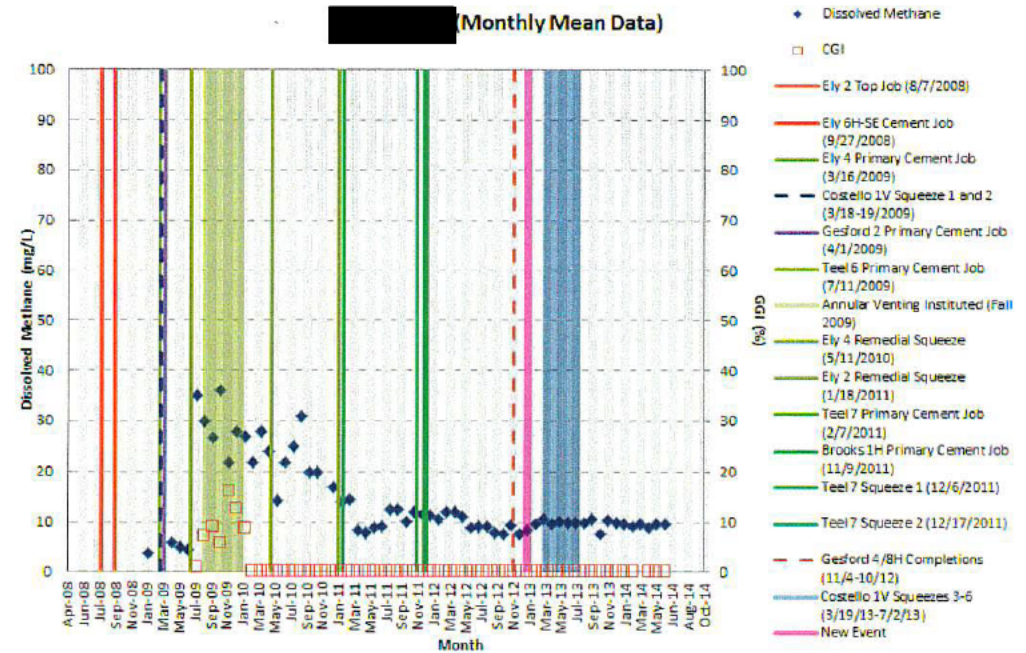
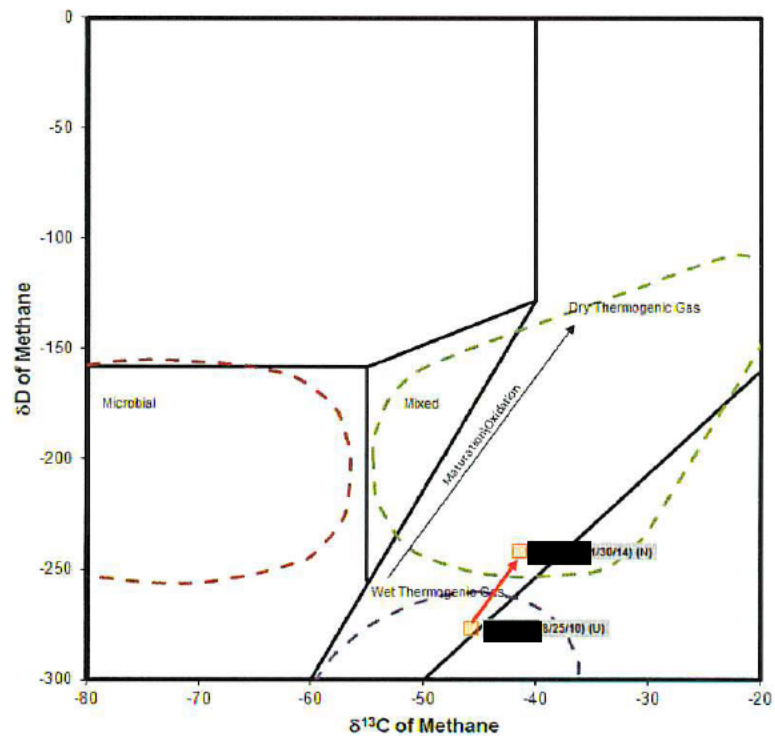
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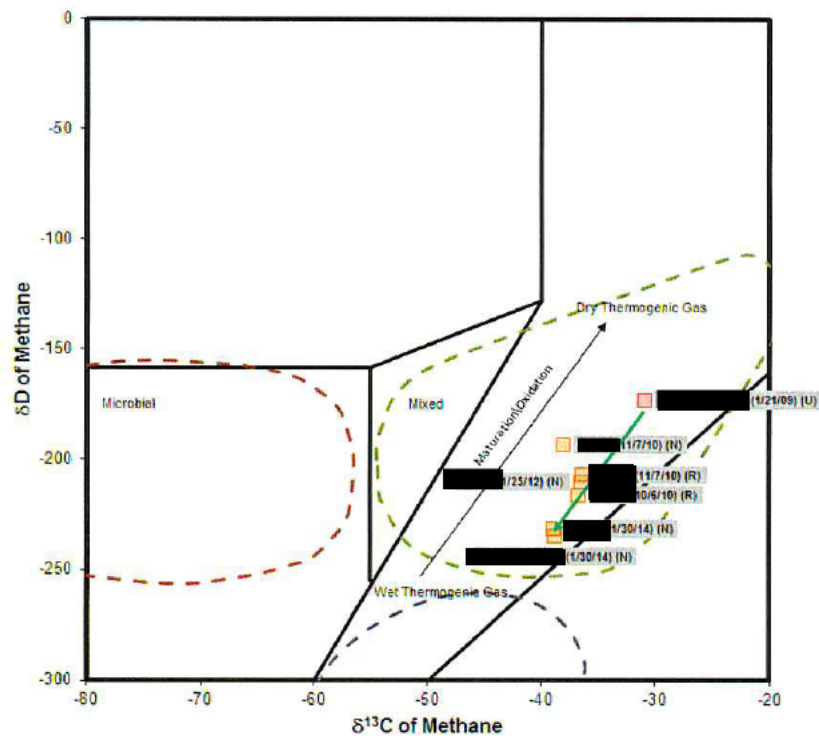
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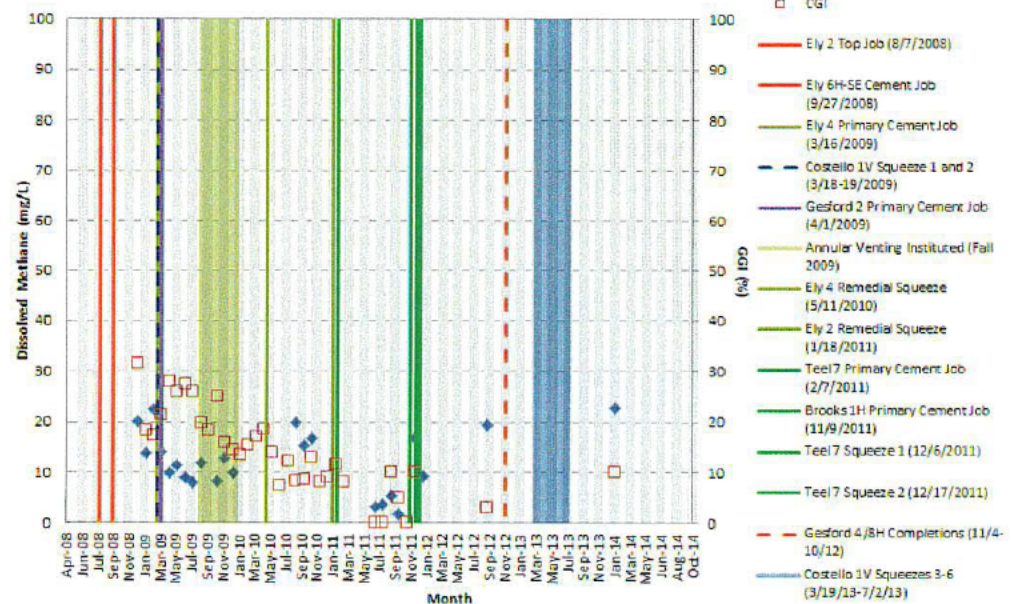
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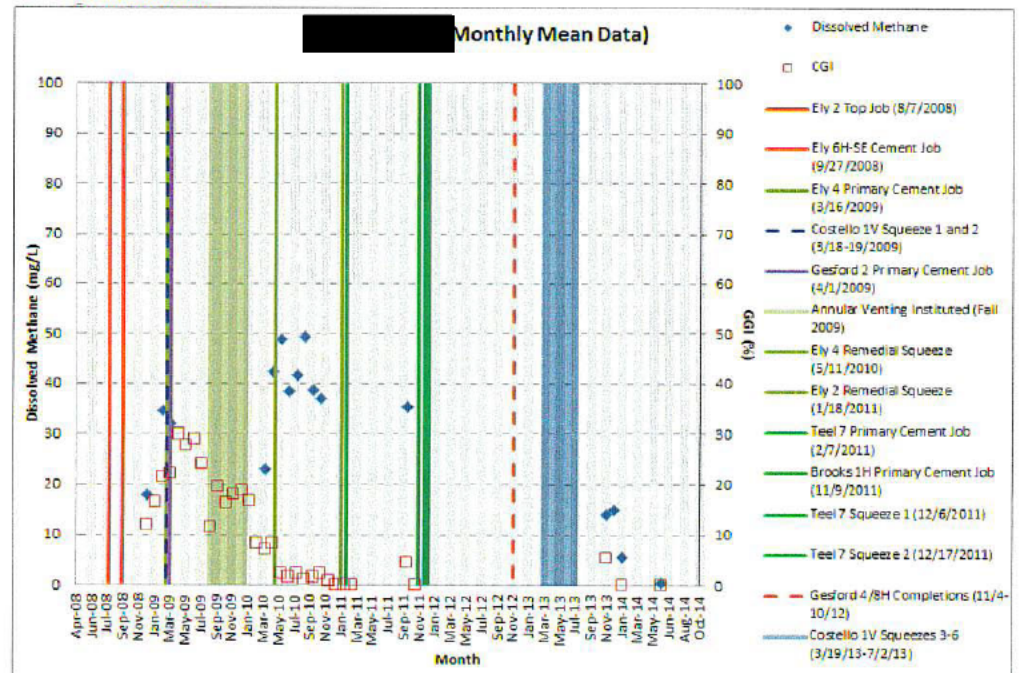
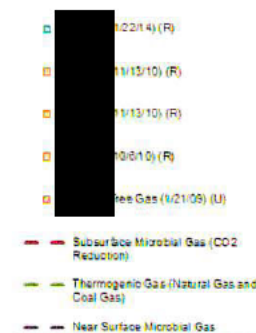
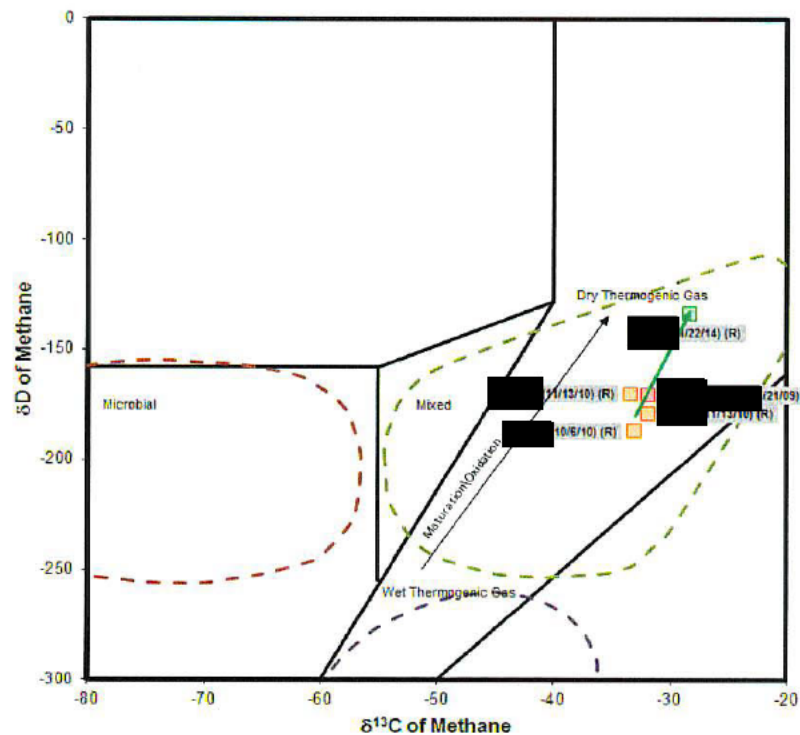
IV. Isotopic Interpretation



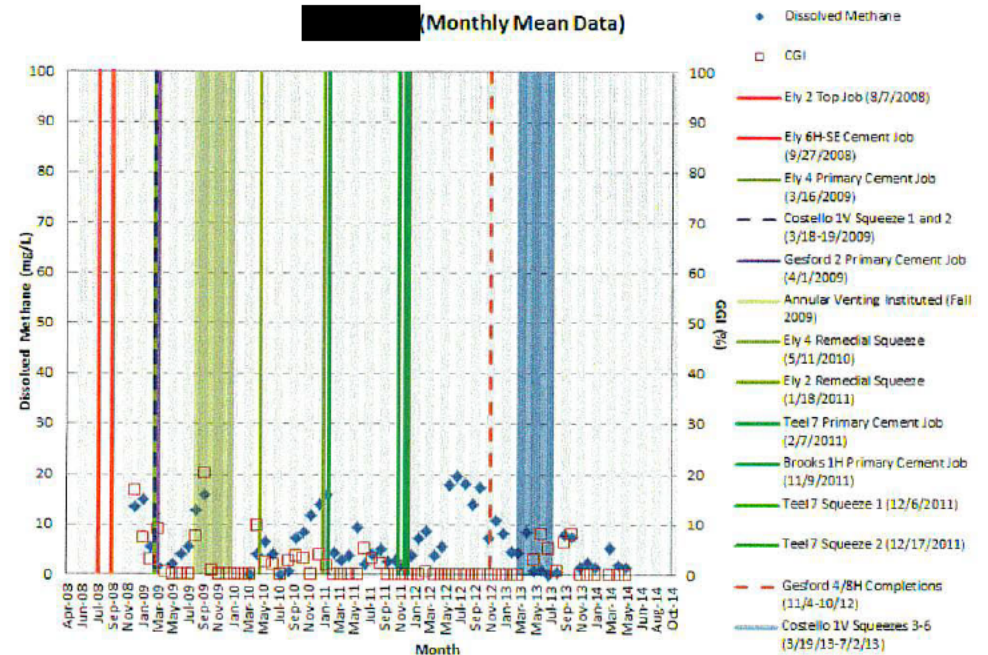
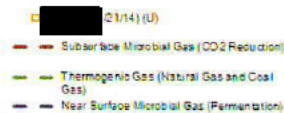
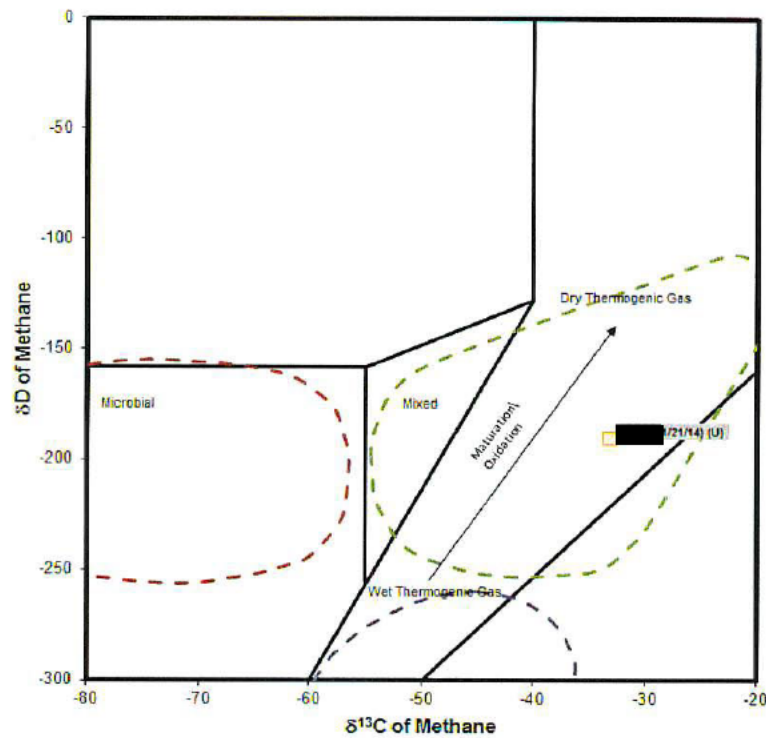
Monthly Mean Data)



IV. Isotopic Interpretation

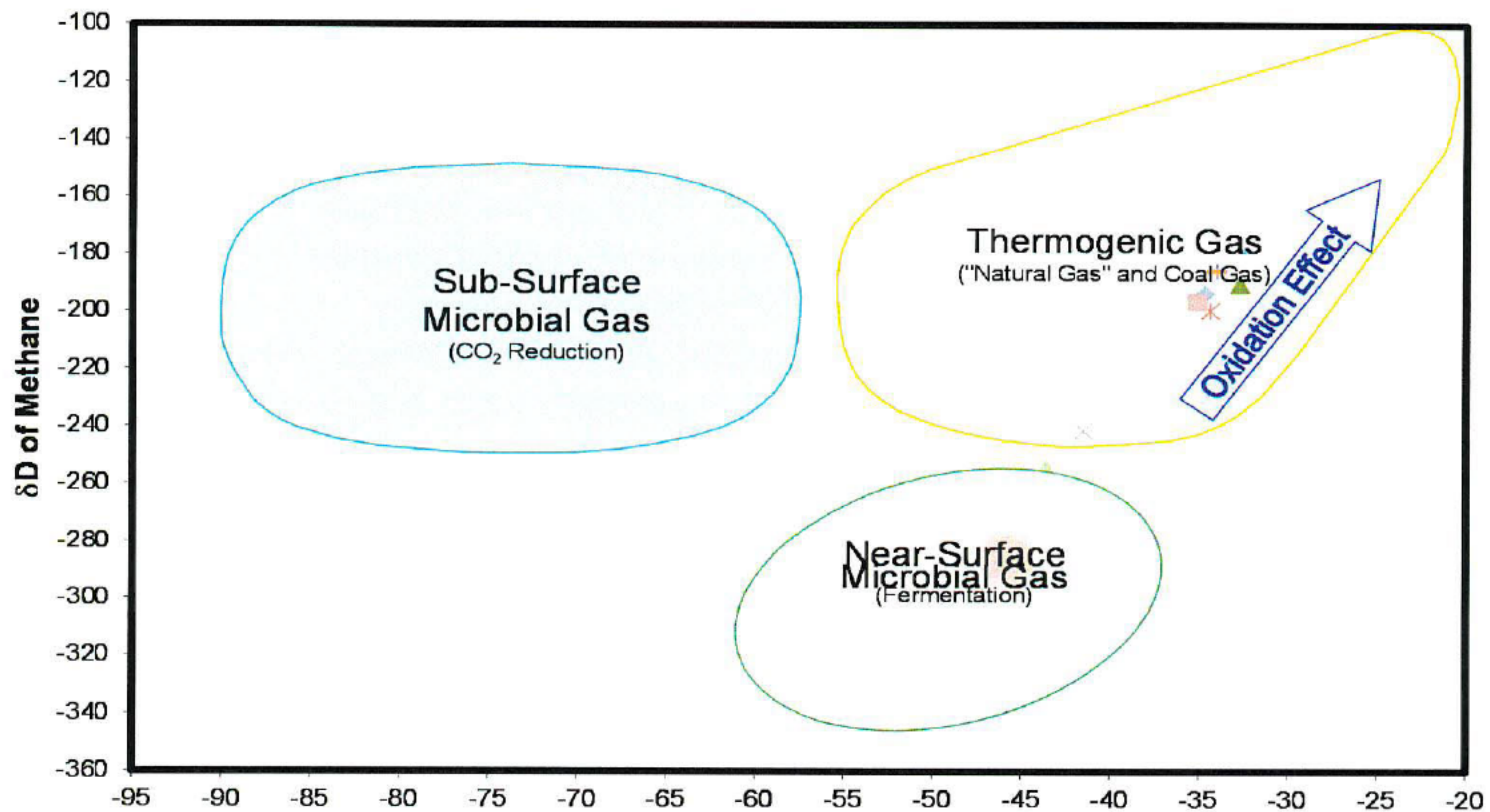


IV. Isotopic Interpretation



V. Ratzel Shut-In Pressure Testing Analysis

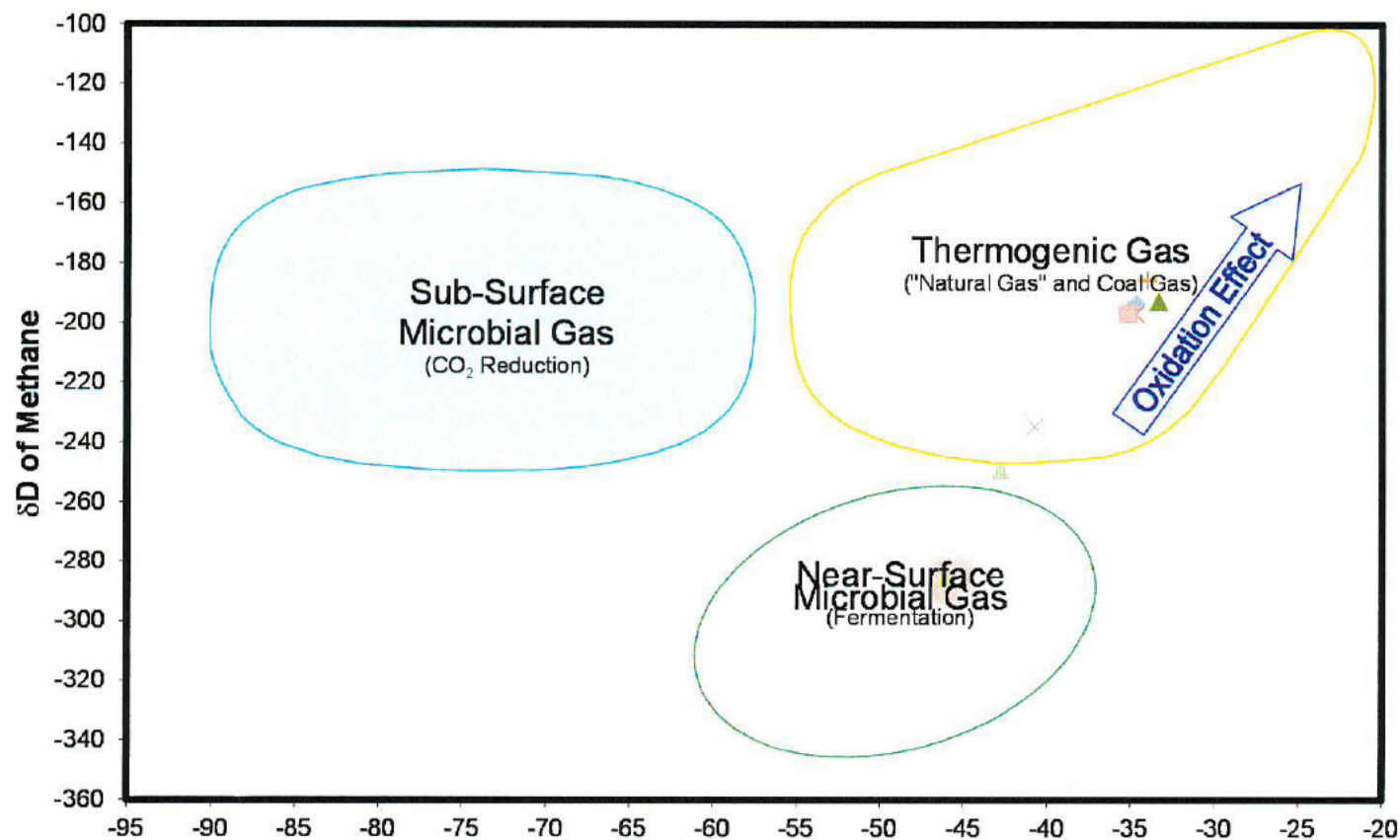
Plot A - Isotope Crossplot
Stray Gas Investigation



▲ 9/6/2012
 × 3/24/2014
 ● Ratzel 1H 9x7
 + Ratzel 1H 7x4
 - Ratzel 2H 7x4
 × Ratzel 3V 7x4
 * Ratzel 3V 9x7
 ▲ 1/22/2014
 ▲ 1/28/14
 × 1/30/14

V. Ratzel Shut-In Pressure Testing Analysis

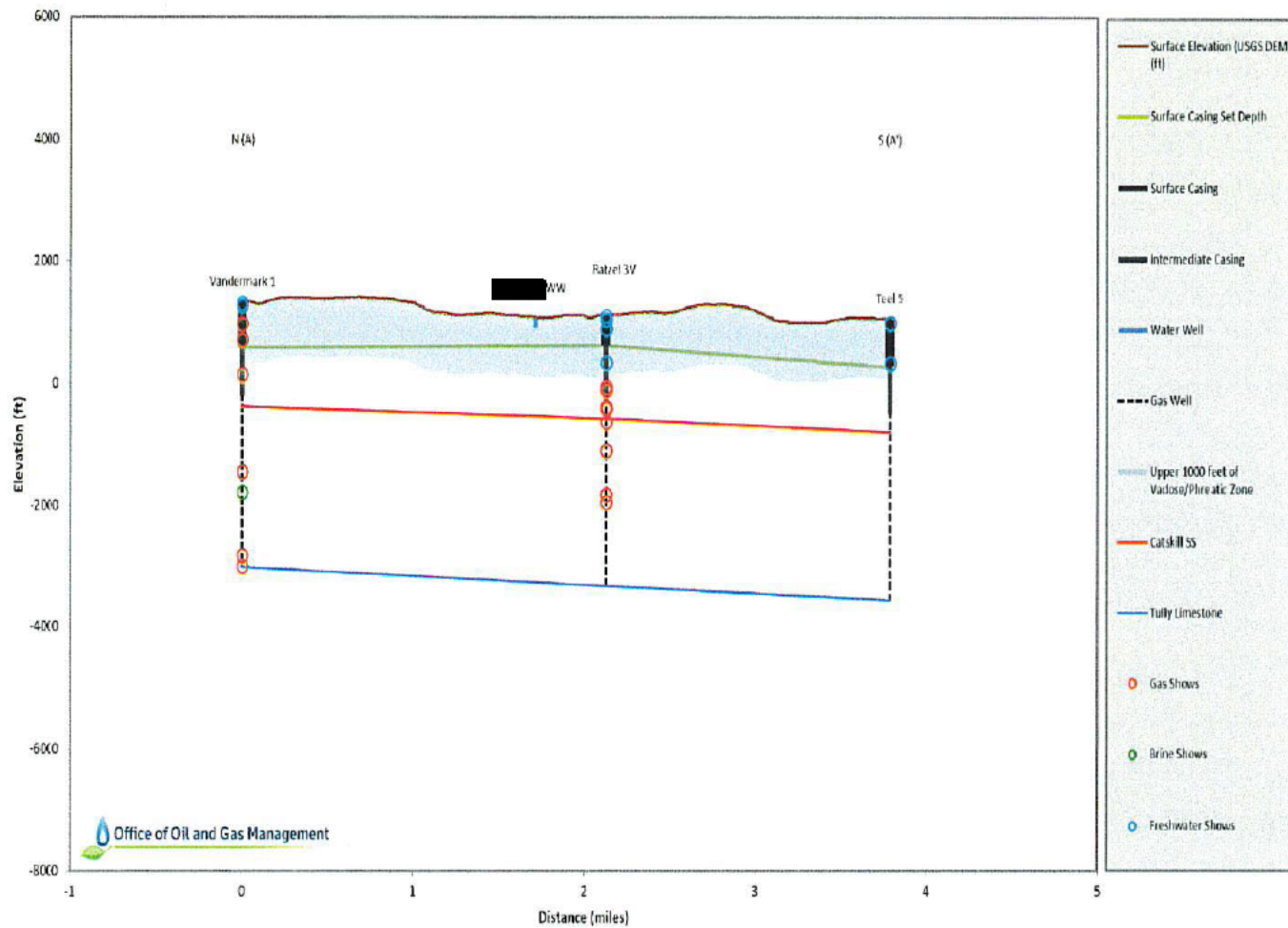
Plot B - Isotope Crossplot
Stray Gas Investigation



5/27/14 x 5/27/14 ● Ratzel 1H 9x7 + Ratzel 1H 7x4 - Ratzel 2H 7x4 - Ratzel 3V 7x4 - Ratzel 3V 9x7 5/27/14 5/27/14 5/27/14

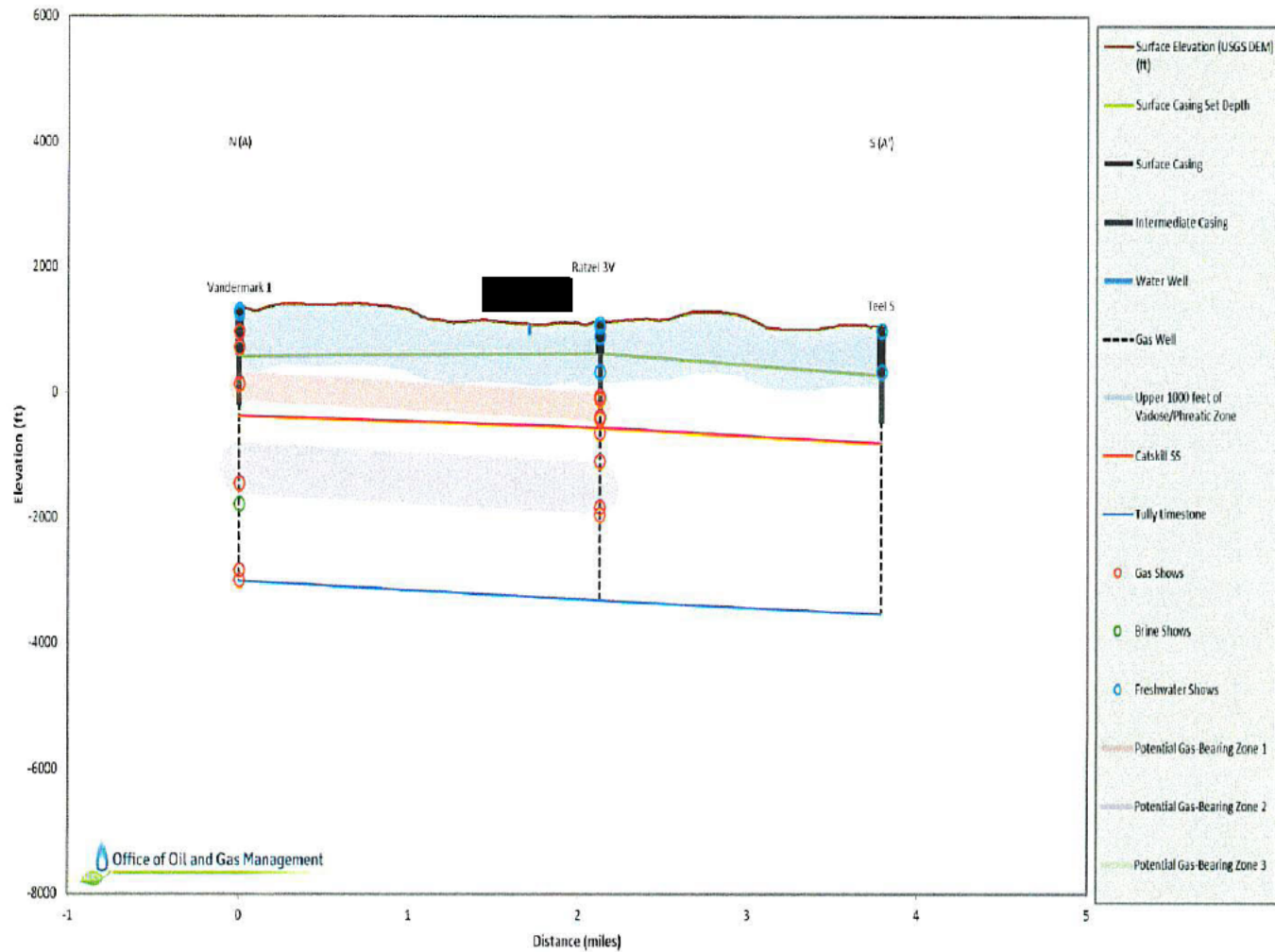
V. Ratzel Shut-In Pressure Testing Analysis

Geologic Cross-Section A-A' (average depth to gas and water shows depicted for vertical well sections; TD of wellbores not shown)



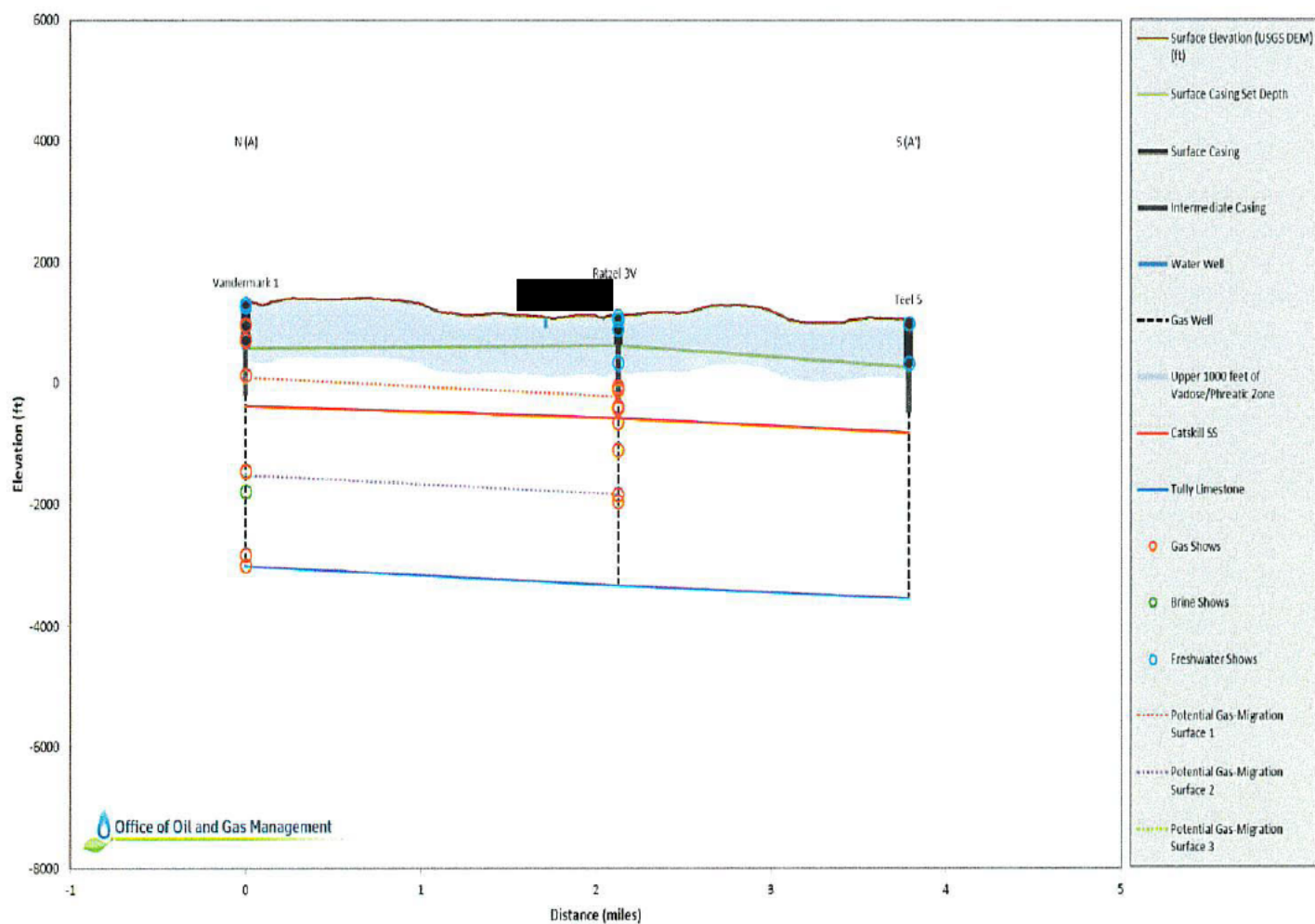
V. Ratzel Shut-In Pressure Testing Analysis

Geologic Cross-Section A-A' (average depth to gas and water shows depicted for vertical well sections; TD of wellbores not shown)



V. Ratzel Shut-In Pressure Testing Analysis

Geologic Cross-Section A-A' (average depth to gas and water shows depicted for vertical well sections; TD of wellbores not shown)

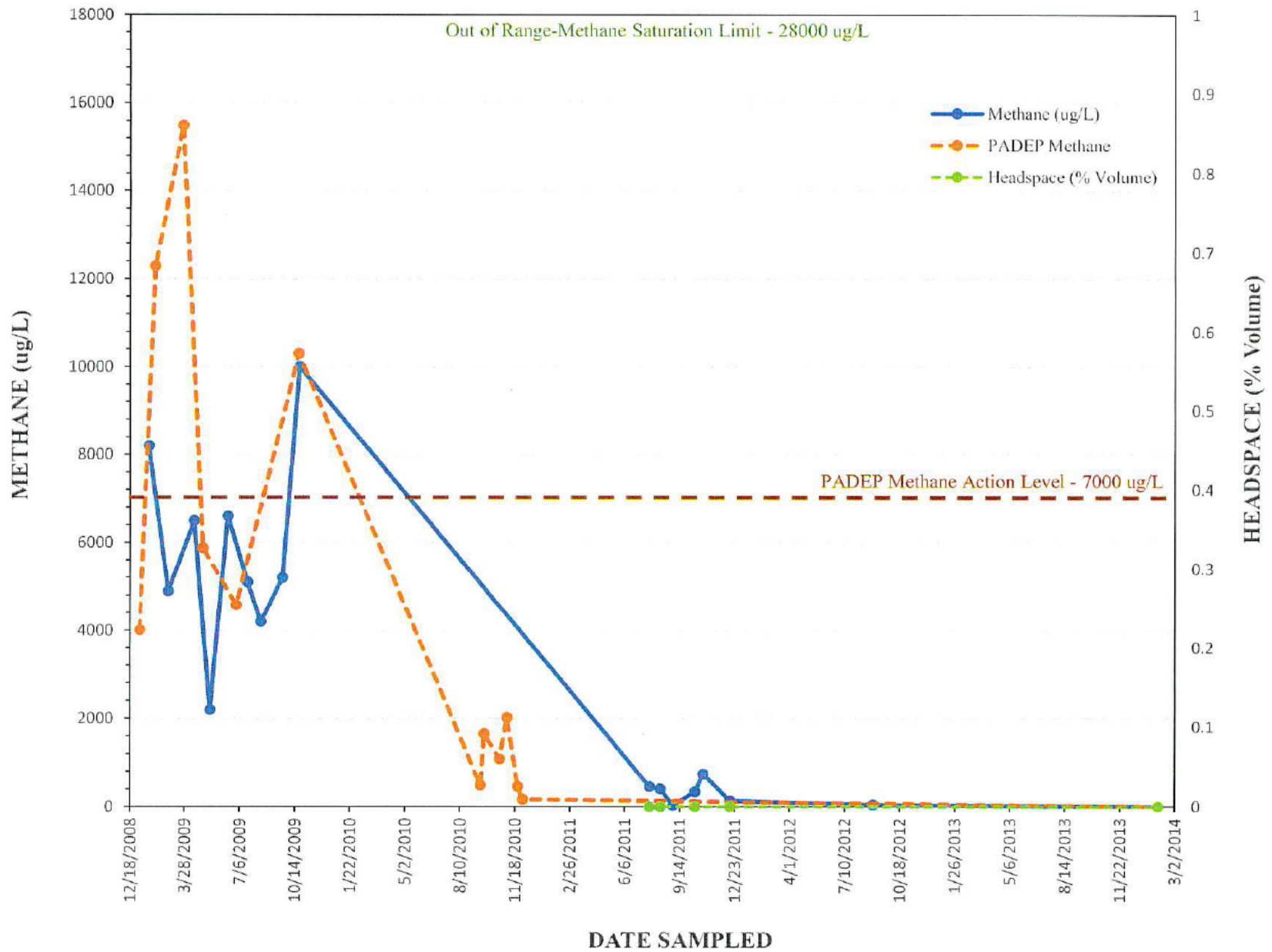


▶ VI. Moving Forward

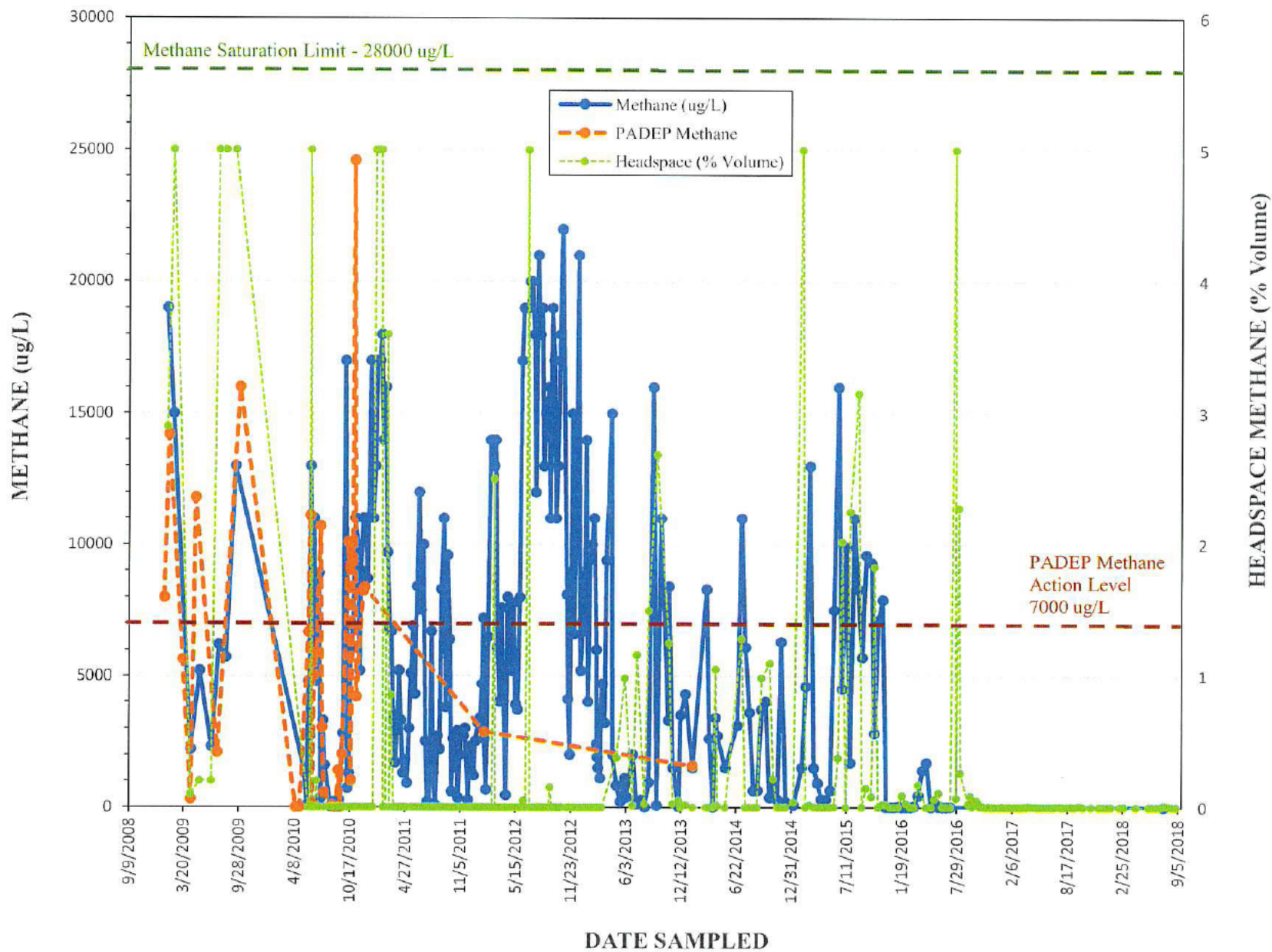
- Closure letters/memos will be written for [REDACTED] (currently owned by Cabot), [REDACTED]. No additional sampling is necessary at any of those properties.
- Closure letters/memos will be written for [REDACTED] due to access denial.
- [REDACTED] should be sampled monthly for at least dissolved and free-phase gases until background is demonstrated. Sampling techniques should involve the use of a submersible pump and consistent purging methodologies.
- [REDACTED] should continue to be sampled bi-weekly for dissolved and free-phase gases along with other standard analysis parameters as part of the ongoing gas migration investigations in the area [REDACTED].
- Gas well integrity assessments should begin at wells in the restricted area that are possibly contributing the more recent gas migration incidents.

Exhibit B –
Resident Time Trend Graphs for Dissolved
Methane and Well Headspace

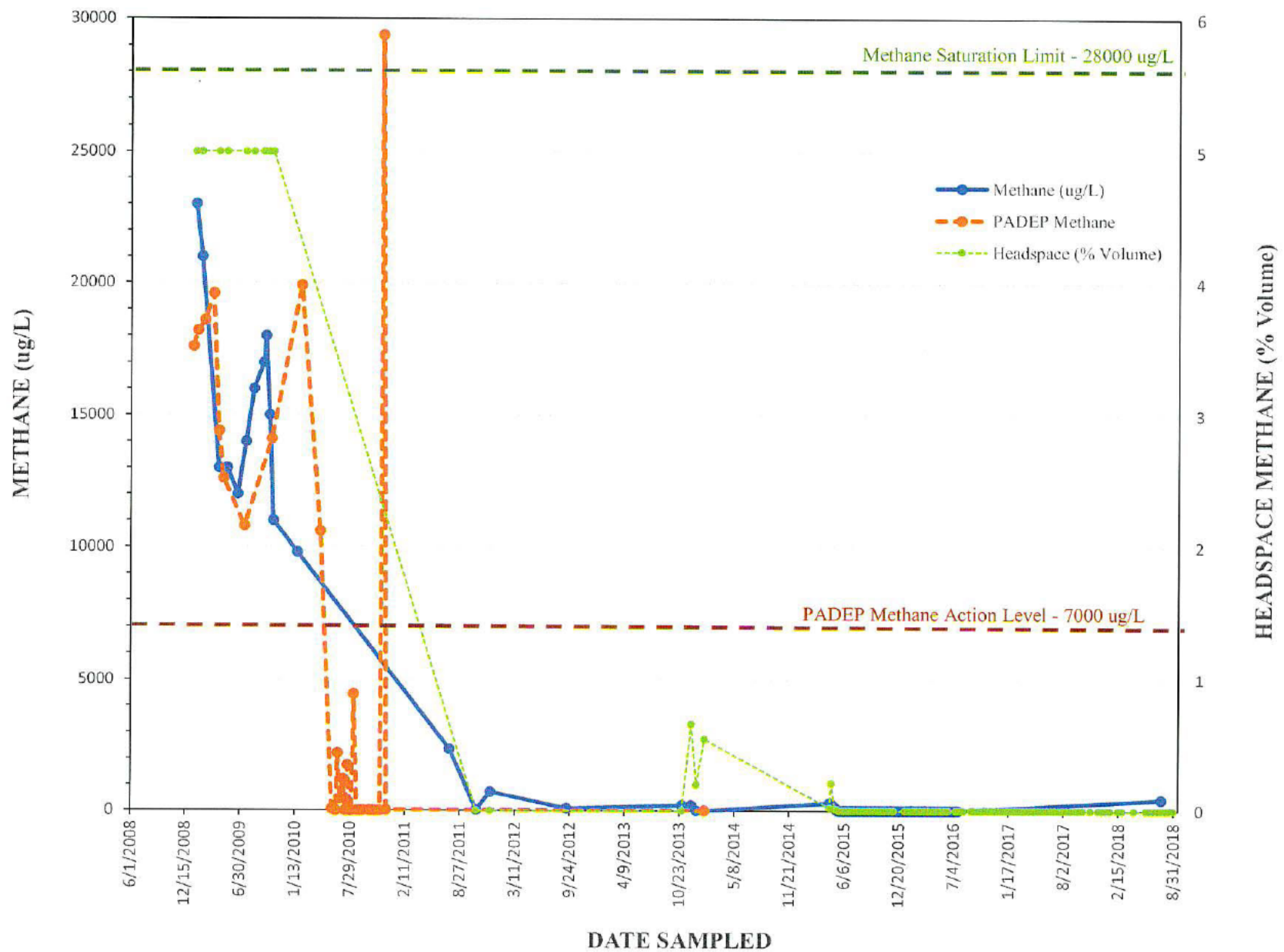
DISSOLVED METHANE CONCENTRATION vs HEADSPACE



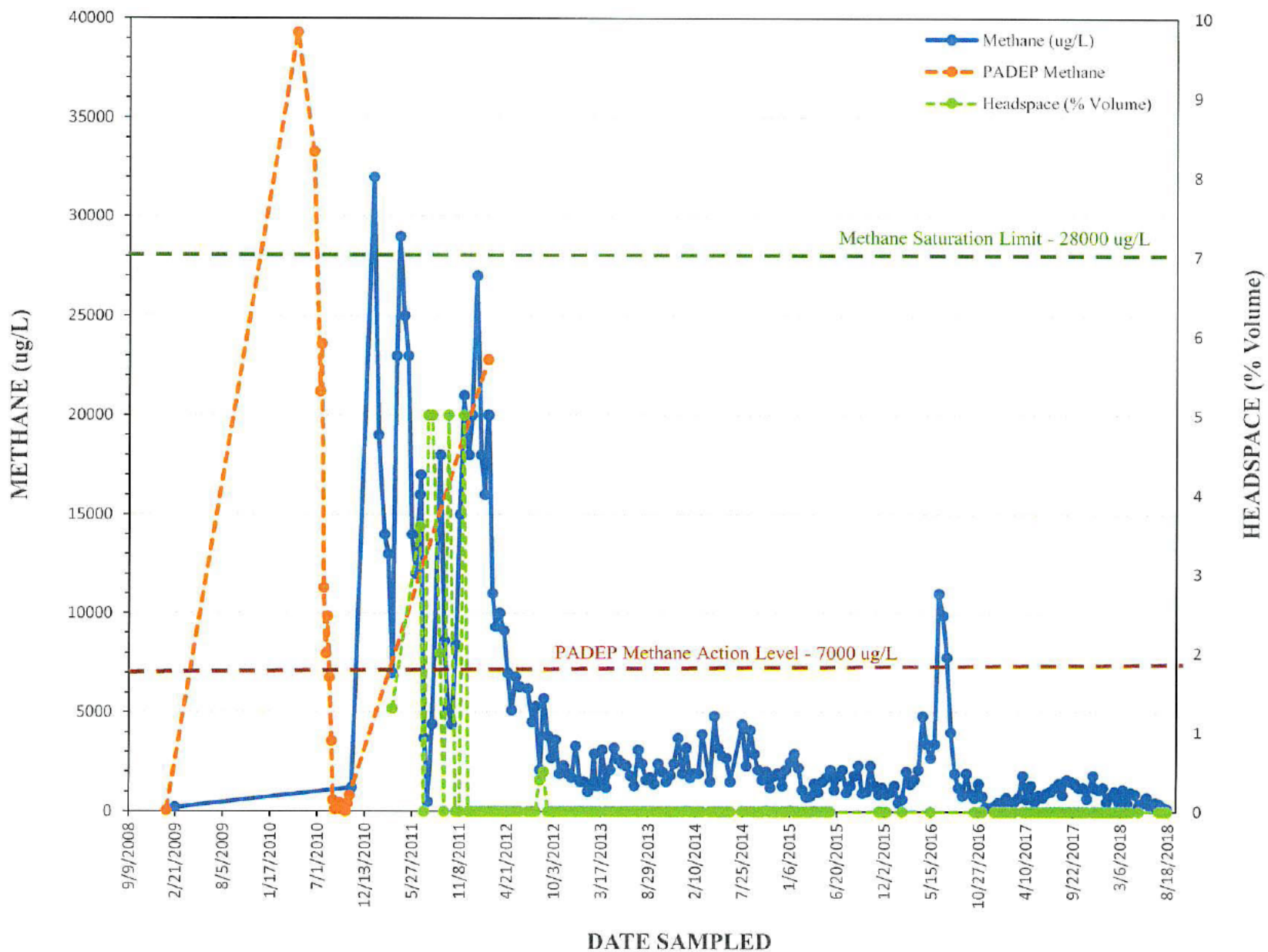
DISSOLVED METHANE CONCENTRATION vs HEADSPACE



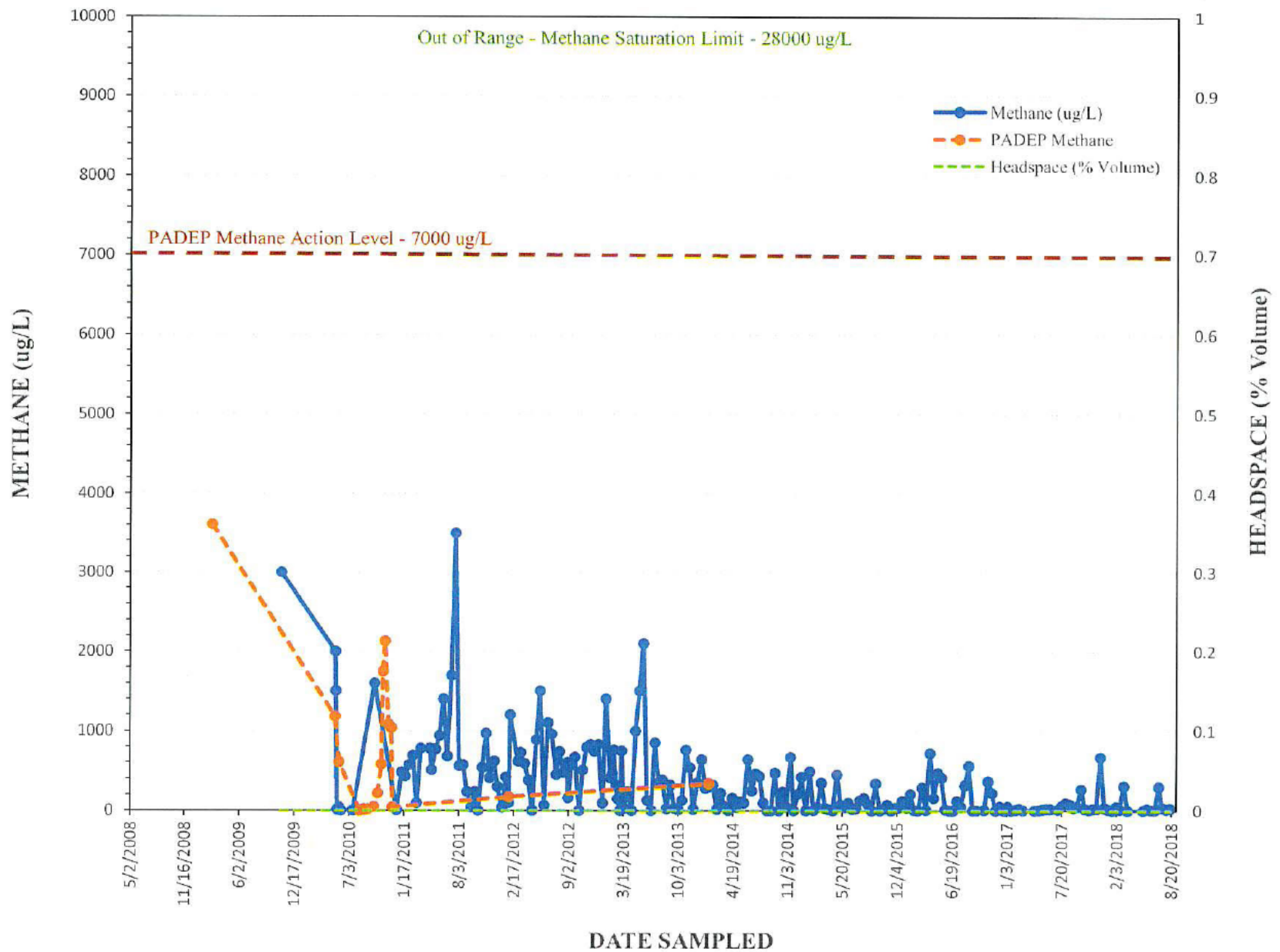
DISSOLVED METHANE CONCENTRATION vs HEADSPACE



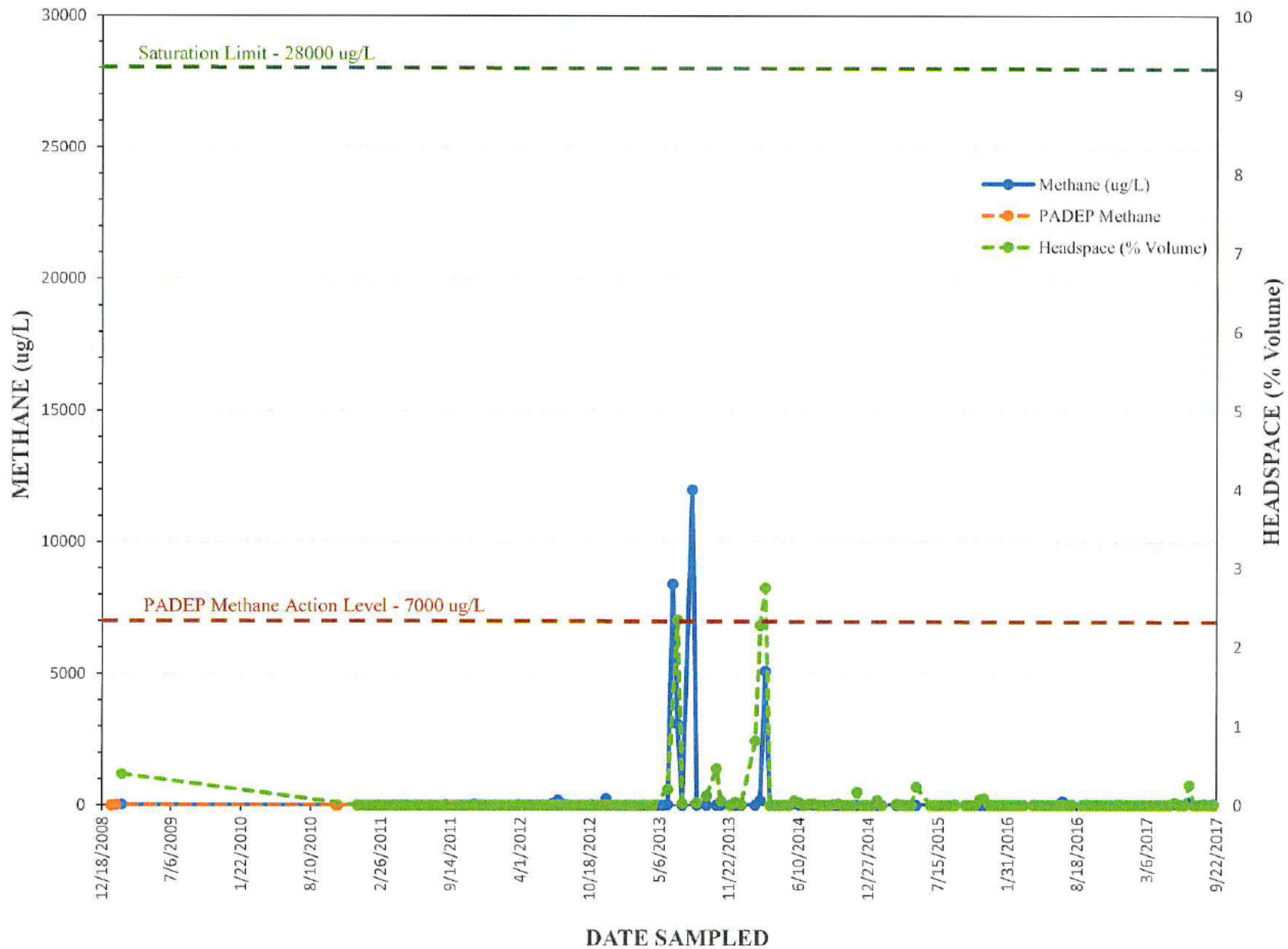
DISSOLVED METHANE CONCENTRATION vs HEADSPACE



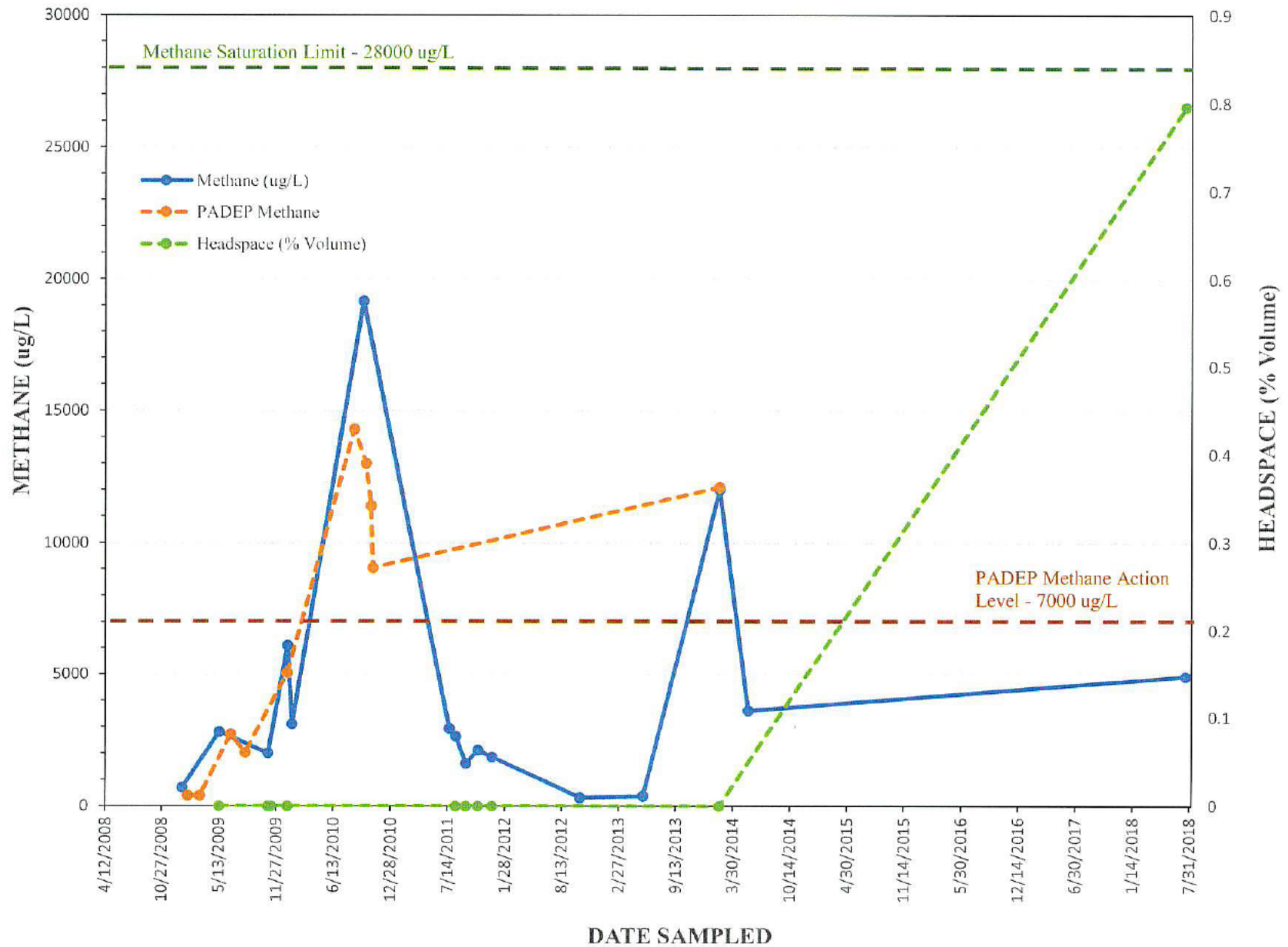
DISSOLVED METHANE CONCENTRATION vs HEADSPACE



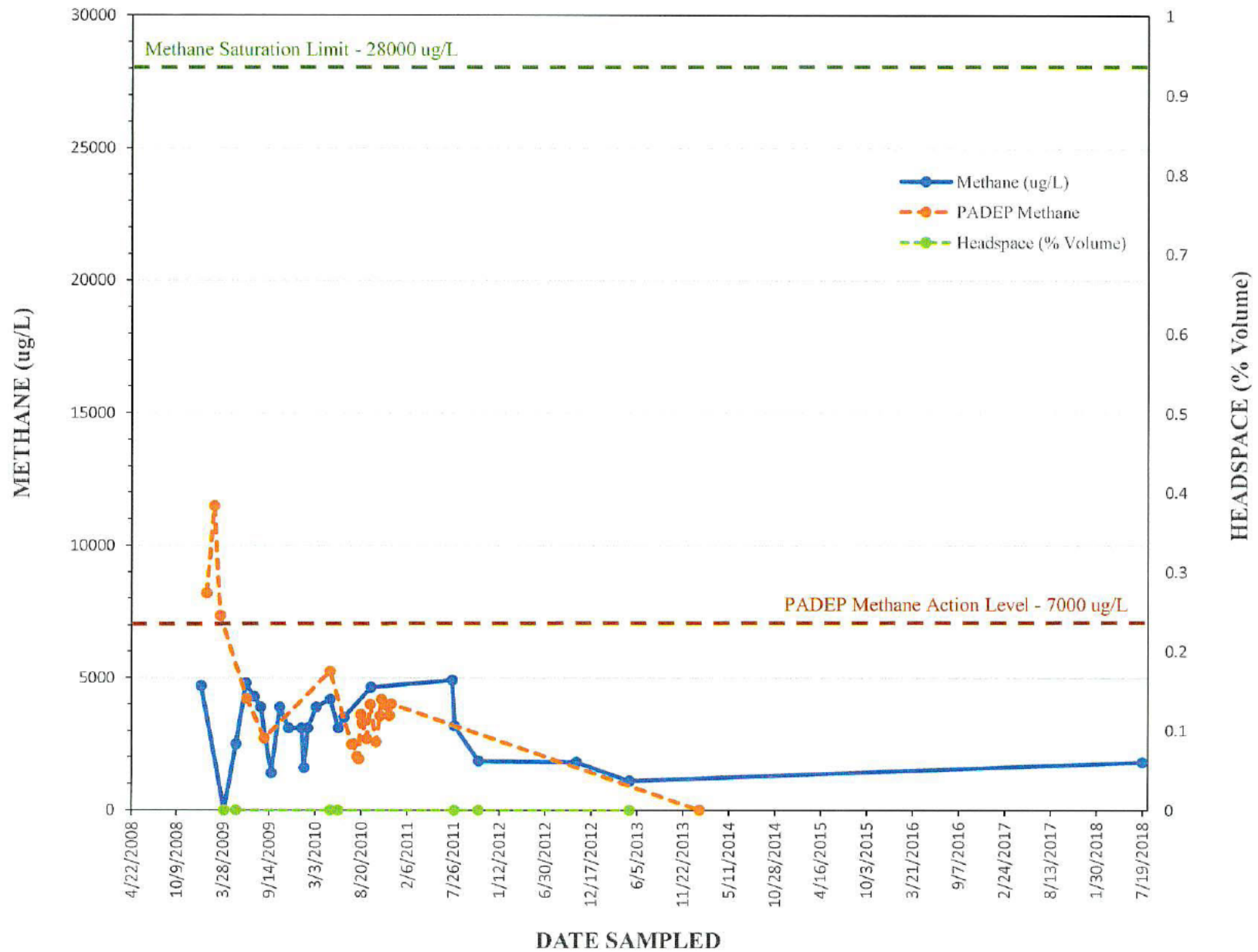
DISSOLVED METHANE CONCENTRATION vs HEADSPACE



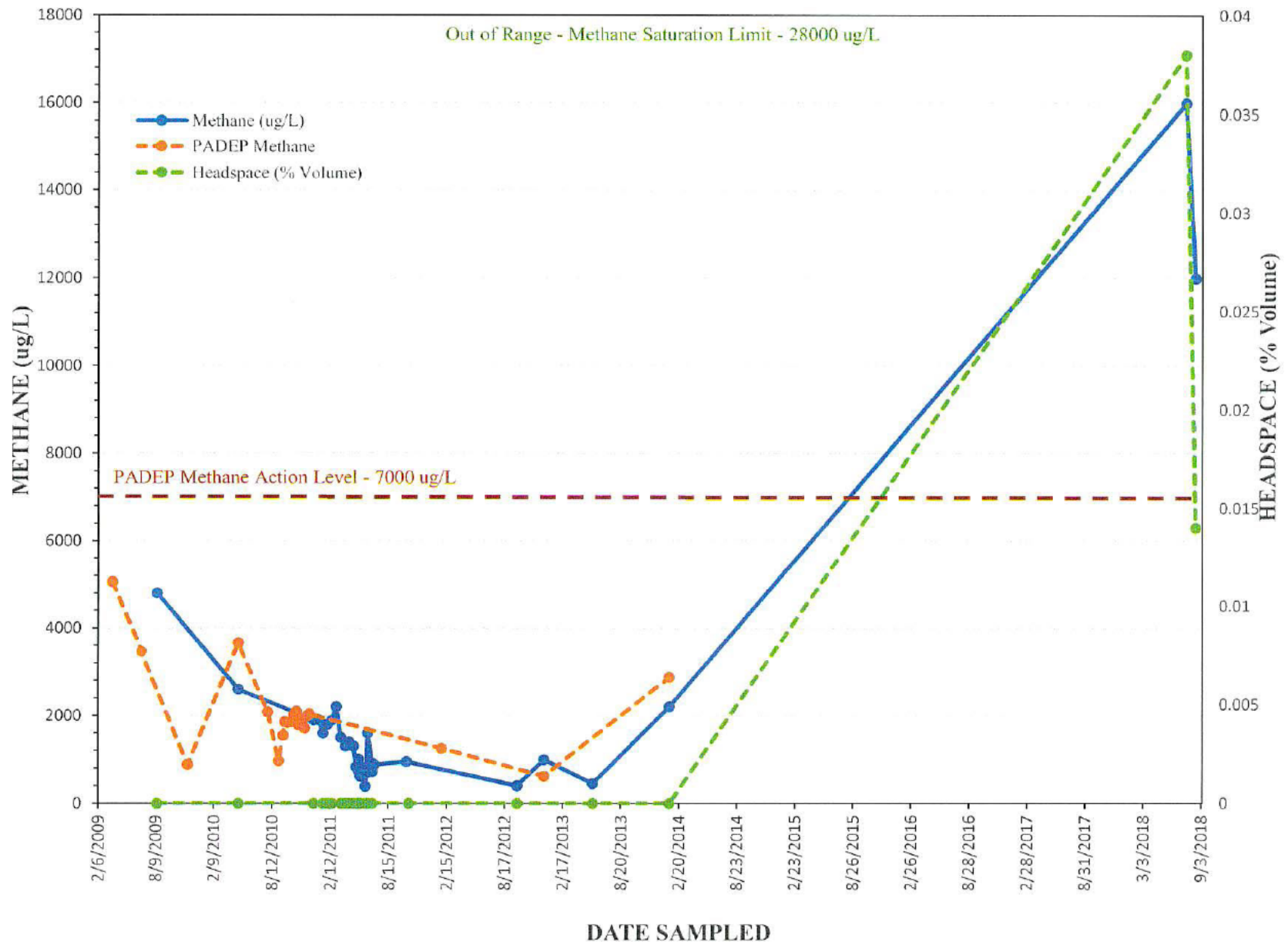
DISSOLVED METHANE CONCENTRATION vs HEADSPACE



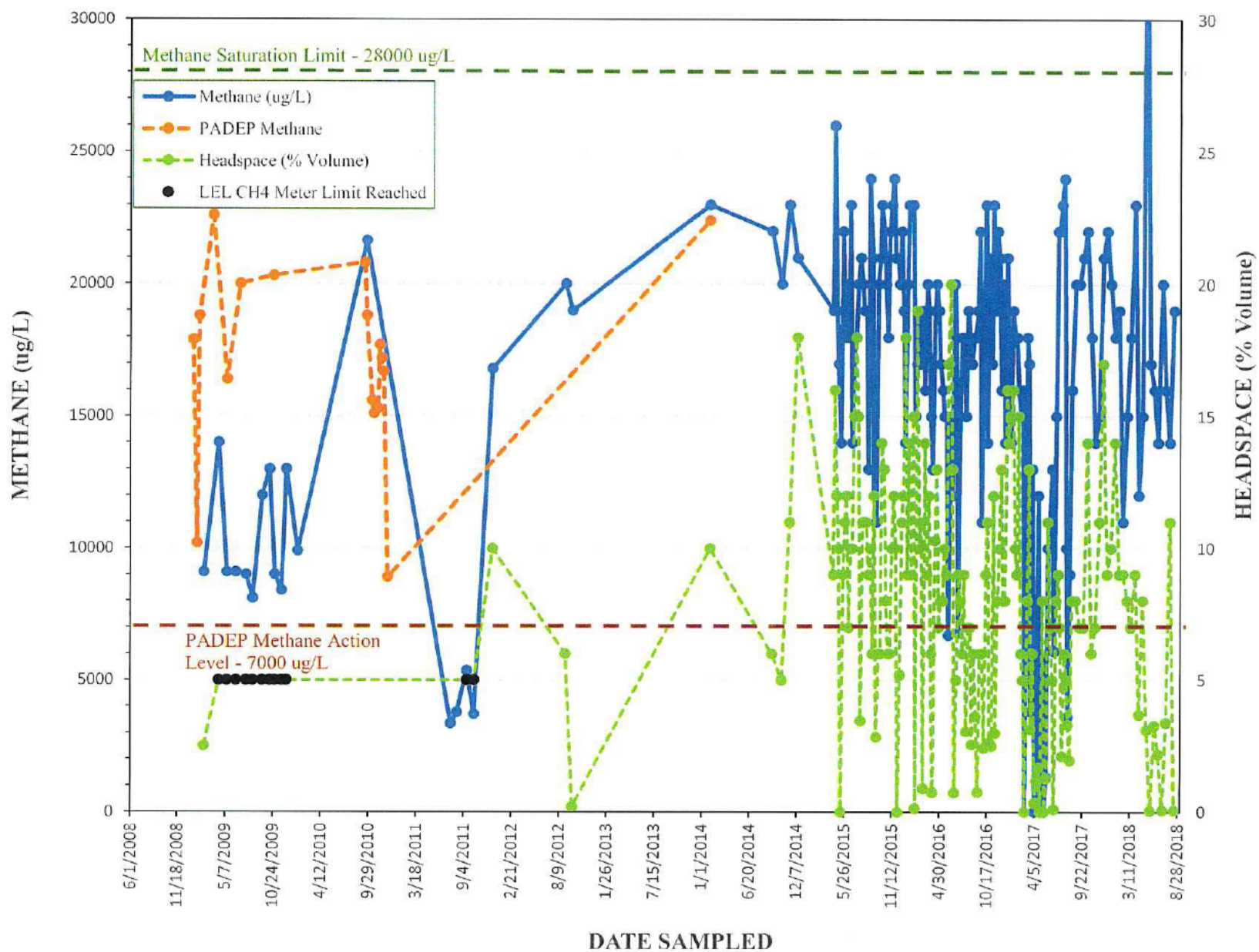
DISSOLVED METHANE CONCENTRATION vs HEADSPACE



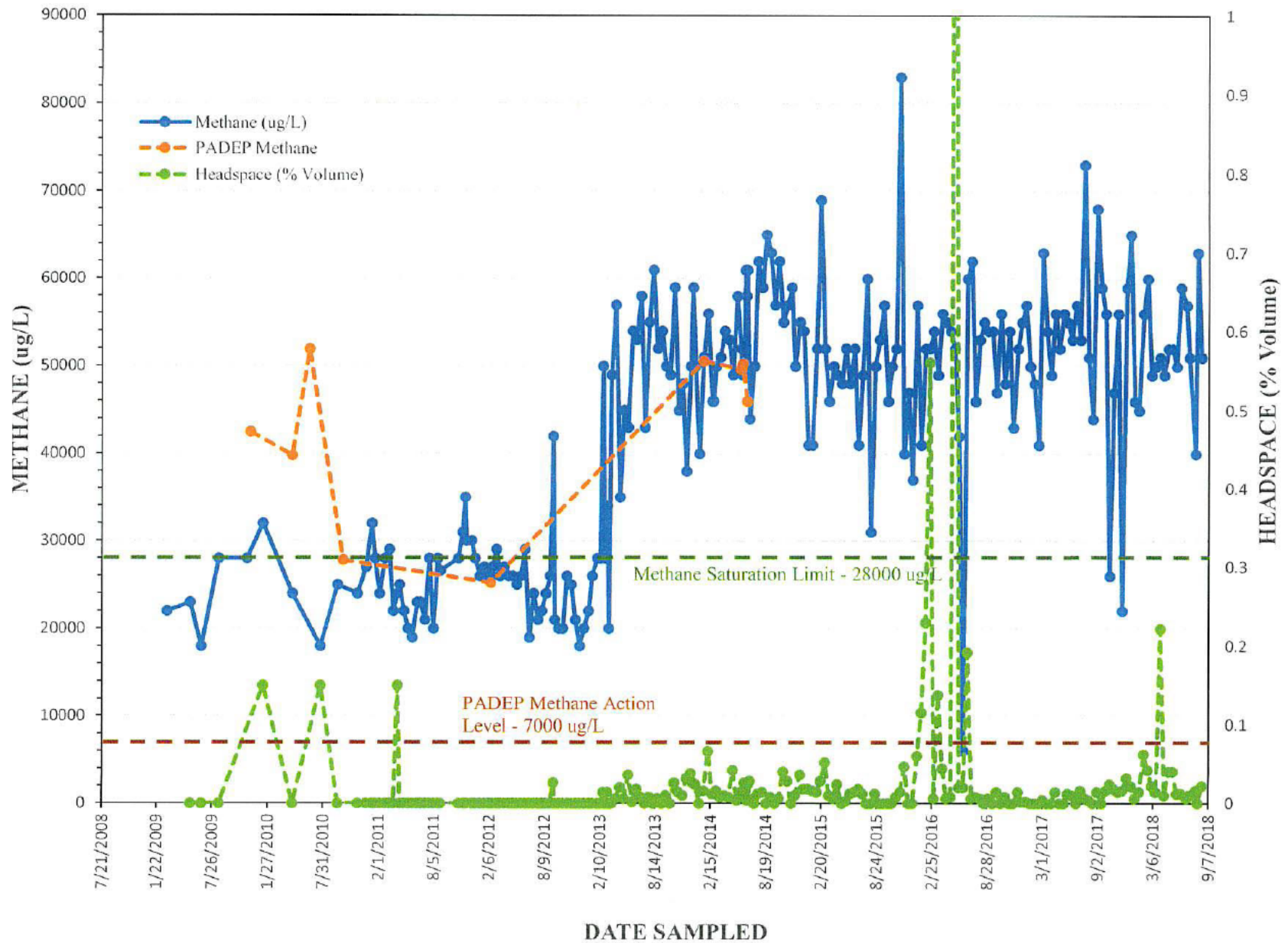
DISSOLVED METHANE CONCENTRATION vs HEADSPACE



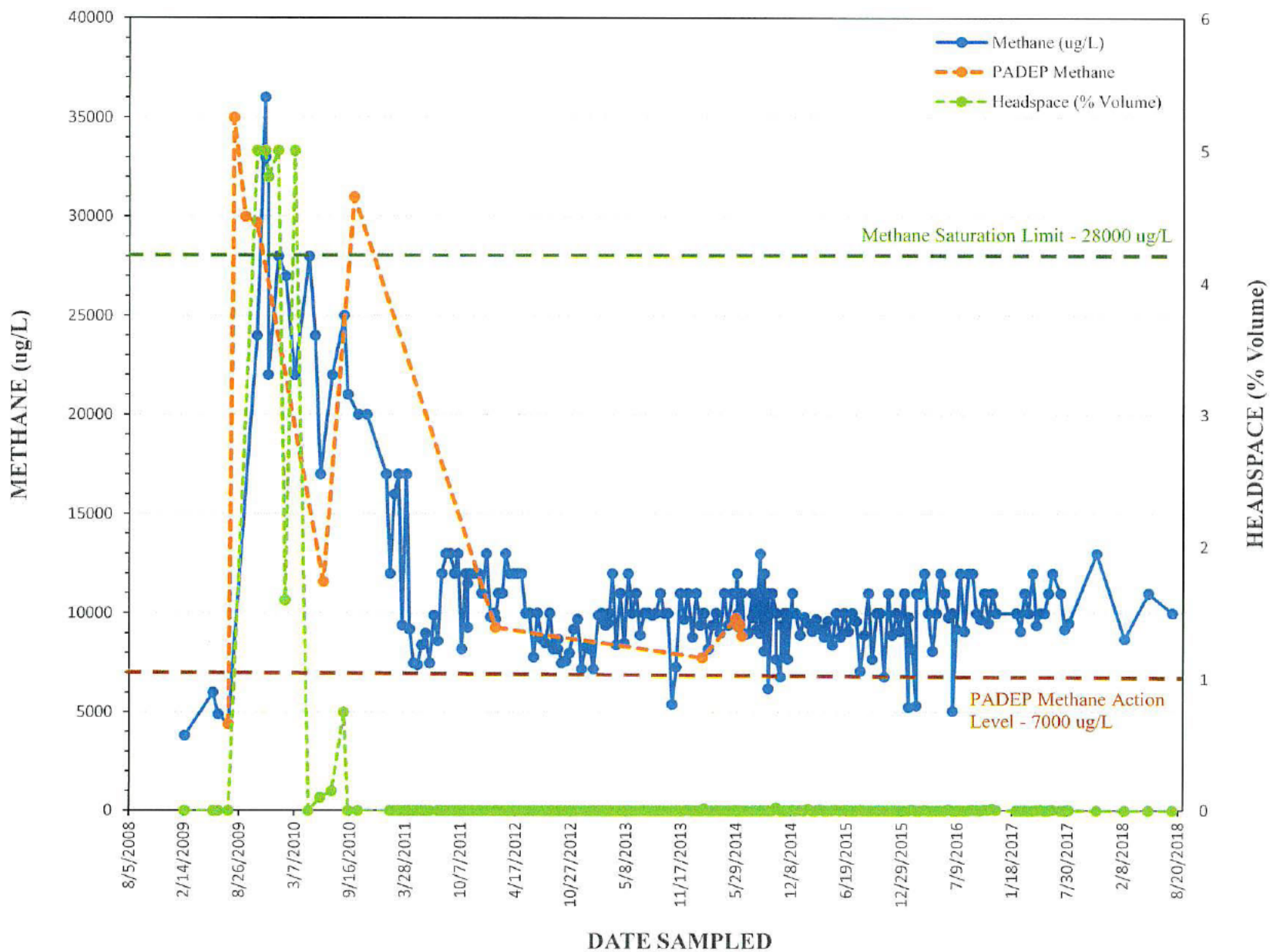
DISSOLVED METHANE CONCENTRATION vs HEADSPACE



DISSOLVED METHANE CONCENTRATION vs HEADSPACE



DISSOLVED METHANE CONCENTRATION vs HEADSPACE



DISSOLVED METHANE CONCENTRATION vs HEADSPACE

