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Subject:
Initial Evaluations of Land-spread Biosolids in Marinette and Oconto Counties
BRRTS# 02-38-583856

ENVIRONMENT

Date:
April 30, 2020

Dear Mr. Neste:

Contact:
Michael Bedard

As you are aware, Arcadis U.S., Inc. (Arcadis) began collecting drinking water samples from properties within 1,200 feet of fields that were identified as having received biosolids from the Marinette Municipal Wastewater Treatment Plant on behalf of Tyco Fire Products LP (Tyco) on March 2, 2020. On March 16, Arcadis and Tyco suspended field sampling operations after the “Safer at Home” executive order by the Governor of Wisconsin and “Social Distancing” guidelines were enacted by Wisconsin and the federal government. Those recommendations were extended by Governor Tony Evers on April 16, 2020 to remain active until at least May 26, 2020. Tyco is prepared to resume sampling within seven days of those restrictions being lifted. Tyco continues to actively monitor the situation relative to COVID-19 so that sampling can resume when that is deemed safe by health experts.

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Prior to suspending residential sampling, Arcadis collected 98 drinking water samples. Preliminary results categories for all 98 wells were shared with Wisconsin Department of Natural Resources (WDNR) on April 14, 2020. Validated laboratory reports and well sample results letter also have been provided to WDNR in tandem with the results letters being delivered to property owners and tenants within ten days of Arcadis receiving those results from the third-party laboratories conducting the analyses. It is important to note that over 75% of wells sampled to date have no detections of perfluorooctanoic acid (PFOA) or perfluorooctanesulfonic acid (PFOS). Further, 91 of 98 samples are below the Wisconsin Department of Health Services (WDHS) recommended groundwater standard of 20 nanograms per liter, or parts per trillion (ppt), being used by Wisconsin.

Based on a combination of preliminary and validated results, there were 7 wells serving 8 parcels with detections above the WDHS recommended groundwater standard. Each of those well owners/users was contacted by Arcadis and those preliminary results were shared with the well owners/users prior to results being validated. This communication occurred independent of any direction from WDNR. Those well users were offered bottled water for drinking, cooking, and brushing their teeth.

Overall, 92.8% of all wells analyzed were below the WDHS recommended groundwater standard. After validation, 74 of the 98 wells sampled had no detections of PFOA or PFOS. Eleven wells had detections below the reporting limit. Six wells were between the reporting limit and 20 ppt combined PFOA and PFOS. Three wells were between 20 and 70 ppt combined PFOA and PFOS, and four wells were above 70 ppt.

While waiting for the State of Wisconsin’s “Safer and Home” Order and “Social Distancing” recommendations to be lifted, Tyco instructed Arcadis to review the data collected to date to ascertain what can be learned from the available data, and what potentially could be gained from the additional information that Arcadis may be able to collect from additional wells when the sampling program is able to safely resume. Consistent with the methodology used for Tyco’s environmental investigation work in the Marinette area, Tyco is committed to a robust, scientific approach.

United States Geological Survey (USGS) topographic maps and Wisconsin Light Detection and Ranging (LiDAR) topographic maps are being evaluated to determine likely drainage conditions for fields. Additional USGS and United States Department of Agriculture (USDA) maps are being used to assess soil conditions in the area. USGS plats developed in the 1970s provide some information on presumed groundwater flow directions in the area and may provide useful insight for the ongoing data evaluation.

Most wells in the area are drilled, cased into bedrock with open boreholes below the casing. Bedrock in the area is generally limestone/sandstone and between 30 and 50 feet deep.

Specific results of note were evaluated against some of the information above with results provided in the table below:

Table 1 Summary of Wells with Combined PFOA/PFOS Detections above 20 ppt

Well ID (BWS#)	PFOA + PFOS (ppt)	Well Depth (feet)	Depth to Bedrock (feet)	Volume Sludge (gallons)	Preliminary Notes
037	1156	Unknown	Unknown	1,771,000	Biosolids spread on fields south of the well. Nearby well log has limestone bedrock at 45 feet and depth to water at 20 feet.
072	142	120	40	1,090,000	Well is near a septic tank/field.
082	142	Unknown	Unknown	1,090,000	Septic tank/field near well. Pole barn type building on the site south of the well.
083	111	Unknown	Unknown	1,090,000	Septic tank/field near well.
089	69.8	122	63	1,090,000	Septic tank/field near well.

Well ID (BWS#)	PFOA + PFOS (ppt)	Well Depth (feet)	Depth to Bedrock (feet)	Volume Sludge (gallons)	Preliminary Notes
032	25.5	50	Unknown	2,148,000	Septic tank/field near well.
051	21	Unknown	Unknown	497,000	Septic tank/field near well. Surface water pond on property may collect surface water overland flow and may act as a groundwater recharge area.

In addition to conducting a preliminary review of the specific conditions of each well, Arcadis also conducted preliminary reviews of results from wells in the vicinity of wells with detections above 20 ppt combined PFOA and PFOS (Table 2). Wells BWS-072, 082, 083, and 089 are essentially co-located within a 4-acre area and have relatively similar results, so they are not compared against one another below. A draft figure (Figure 1) depicting well locations is attached.

Table 2 Summary of Additional Results

BWS#	Nearby Wells	Results	Notes
037	067 – ~3,000 ft WNW 035 – ~8,100 ft SE 045 – ~6,700 ft SE	<Reporting Limit Not detected Not detected	If wells are all cased and screened at similar depths, there may be a defined boundary for impacts affiliated with BWS-037
072	069 – ~1,300 ft SW 094 – ~1,900 ft W 095 – ~1,800 ft W	18 ppt PFOA+PFOS Not detected Not detected	Groundwater flow directions are assumed to be toward Lake Noquebay
082	069 – ~800 ft W 094 – ~1,800 ft WNW 095 – ~1,700 ft WNW	18 ppt PFOA+PFOS Not detected Not detected	Groundwater flow directions are assumed to be toward Lake Noquebay
083	069 – ~600 ft W 094 – ~1,600 ft WNW 095 – ~1,500 ft WNW	18 ppt PFOA+PFOS Not detected Not detected	Groundwater flow directions are assumed to be toward Lake Noquebay
089	069 – ~900 ft SW 094 – ~1,900 ft W 095 – ~1,400 ft W	18 ppt PFOA+PFOS Not detected Not detected	Groundwater flow directions are assumed to be toward Lake Noquebay
032	010 – ~3,800 ft SE 015 – ~2,600 ft SE 060 – ~600 ft S	Not detected Not detected <Reporting Limit	BWS-032 is virtually surrounded by wells that had no detections above the reporting limit for PFOA and PFOS
051	052 – ~400 ft NE 053 – ~700 ft SE 046 – ~7,600 ft S	Not detected 5 ppt PFOA Not detected	

The distribution of PFAS compounds in the results to date vary to some degree. The results at BWS-032 are PFOS-dominant. The group of wells on the south side of Lake Noquebay (BWS-072, 082, 083, and 089) have relatively similar levels and types of PFAS detections. Those detections are not PFOA-dominant and PFHxS was detected above 10 ppt (these results were flagged for blank contamination). BWS-037 has a similar PFAS mixture as the group of four, but at greater concentrations. BWS-051 has PFOA just above the WDHS recommended groundwater standard, but other compounds were detected in higher concentrations. Across the larger spectrum of results, certain compounds consistent with products or industries not affiliated with aqueous film-forming foams (AFFFs) were consistently present.

Over the next few weeks, Tyco and Arcadis will continue work to gain access to drinking water wells from currently non-responsive property owners to increase the quantity of available data once it is deemed safe by health professionals to continue sampling. Arcadis also will review additional resources to determine whether there is a relationship between hydrogeology and volumes of applied biosolids.

Tyco looks forward to continuing to provide updates to WDNR as more data become available.

Sincerely,

Arcadis U.S., Inc.



Michael Bedard
Arcadis Program Leader

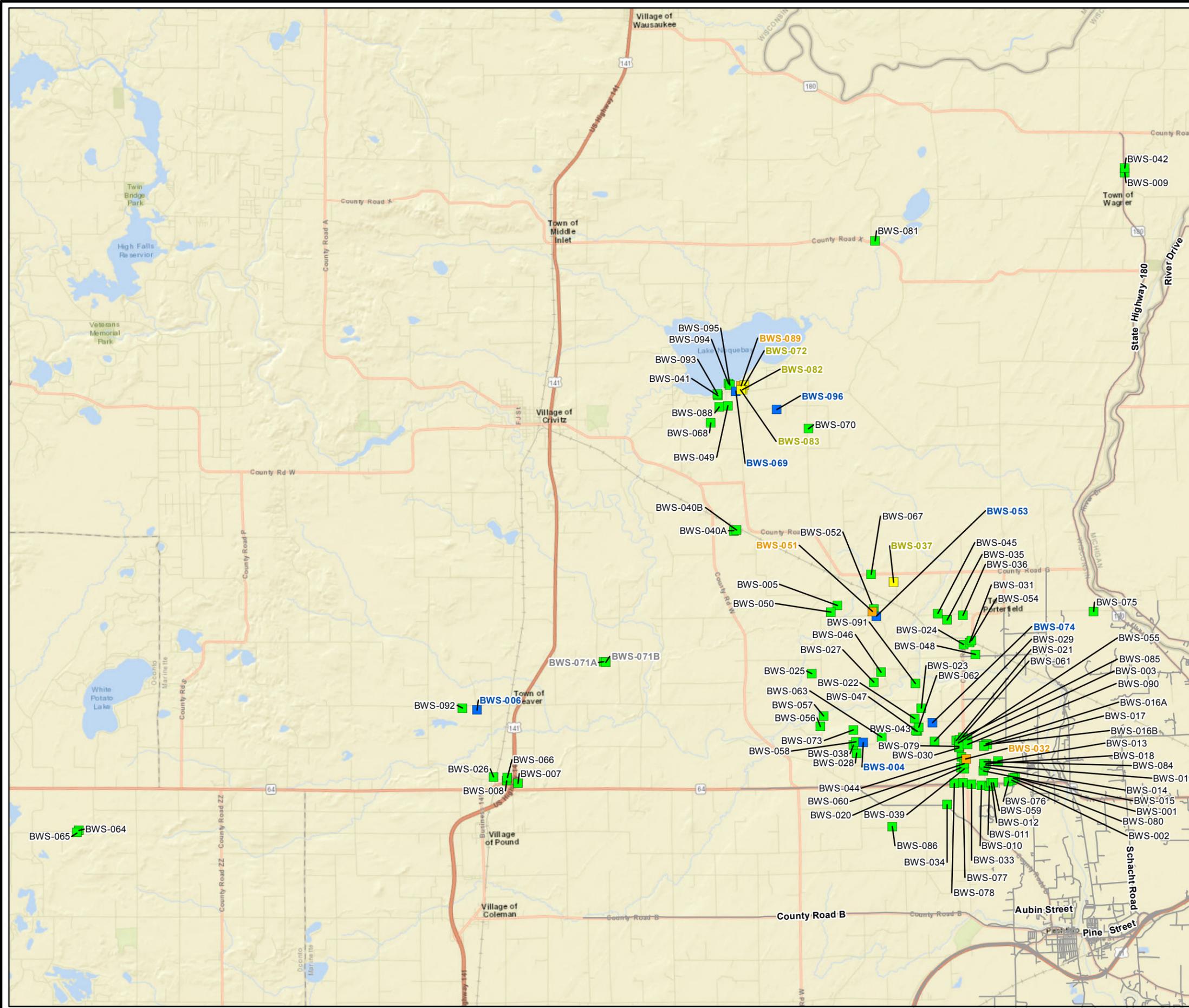
Copies:

Roxanne Chronert, DNR
Jeff Danko
Rick Bethel
Scott Wahl

Enclosures:

Figures

- 1 Land-applied Biosolids Drinking Water Well Locations



LEGEND:

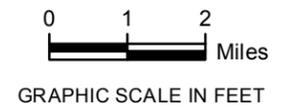
Drinking Water Results

- PFOA and/or PFOS below reporting limit (RL)
- PFOA and/or PFOS detection – RL < 20 ppt
- PFOA and/or PFOS detection – 20 – 70 ppt
- PFOA and/or PFOS detection above HAL

Notes:

ppt = parts per trillion
 HAL = Health Advisory Level
 PFOA = Perfluorooctanoic acid
 PFOS = Perfluorooctanesulfonic acid
 BWS-001 = Well sample identification
 Well locations are approximate
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**4/22/2020
 DRAFT**



LAND-APPLIED BIOSOLIDS IN
 MARINETTE AND OCONTO COUNTIES

**LAND-APPLIED BIOSOLIDS
 DRINKING WATER WELL LOCATIONS**

