Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

Northeast Regional Office • 205B Lowell Street, Wilmington MA 01887 • 978-694-3200

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January 14, 2021

Carlisle Public Schools
83 School Street
Carlisle, MA 01741
Attn: Nancy Donnelly, Administrative Assistant

Re: City/Town: Carlisle
PWS Name: Carlisle Public Schools
PWS ID #: 3051004
Program: Sanitary Survey
Action: Sign and Return

Dear Ms. Donnelly:

On November 12, 2020, a sanitary survey of the Carlisle Public Schools ("Carlisle PS") was conducted by the Massachusetts Department of Environmental Protection ("MassDEP" or "the Department") Drinking Water Program. A sanitary survey is an on-site review of the water sources, facilities, equipment, administrative, financial, operation and maintenance of a public water system, conducted to evaluate its ability to produce and distribute safe drinking water.

Please be advised that this Sanitary Survey was conducted remotely due to the COVID-19 state of emergency. While MassDEP staff evaluated all of the required survey elements, certain information was provided by the owner/operator and not independently verified by MassDEP staff. Any violations of the Massachusetts Drinking Water Regulations or deficiencies with regard to MassDEP standards, guidelines, or policies which were discovered in the course of this survey, are listed in the attached Inspection Report and/or other updated information.

Any person who owns or operates a public water system is responsible for the safety of the system under his or her control. If violations or deficiencies have been noted, you should proceed to take the corrective actions specified in Table A, B and/or C of the Inspection Report and attached compliance plan by the date(s) specified without delay. Please print two copies of this Sanitary Survey, one copy to maintain at the above-referenced public water system and return one copy signed by the person who participated in the survey to this office by February 14, 2021. As part of the sanitary survey, an assessment of the system's capacity was conducted. That assessment determined that Carlisle PS has Adequate Capacity.

MassDEP was represented at the survey by Melika Uter. Please contact Ms. Uter at (978) 694-3345 and/or Melika.Uter@mass.gov if you have any questions or comments. Please note that during the COVID-19 emergency this document is being provided without a signature although it does indicate the formal issuance of the attached document. A signed copy is available upon request once normal office operations resume.

Melika Uter — Environmental Analyst

Amy Lachance — Drinking Water Section Chief

Received by _____for the above-referenced public water system.
Signature of PWS Representative: _____ Date: _____

cc: Operator
File Name: Y:\DWP Archive\NERO\Carlisle-3051004 -Sanitary Survey-2021-01-14

Commonwealth of Massachusetts

Department of Environmental Protection

Drinking Water Program

Non-Transient Non-Community (NTNC) Public Water System

Sanitary Survey

Date of Survey: November 12, 2020
Surveyor: Melika Uter

Non-Transient Non-Community (NTNC) Public Water System
Sanitary Survey

City/Town: Carlisle
PWS ID No: 3051004
PWS Name: Carlisle Public Schools
PWS Address: 83 School Street
Carlisle, MA 01741

Contact: Nancy Donnelly, Administrative Assistant
83 School Street
Carlisle, MA 01741
Office Phone: 978-371-2279
Facsimile: 978-318-1923
Email: dflannery@carlisle.k12.ma.us
School Phone: 978-369-6550 Ext. 2002
School Facsimile: 978-371-2400
School Website: https://www.carlisle.k12.ma.us/
Owner: Town of Carlisle
Board of Selectmen
66 Westford Street
Carlisle, MA 01741
Office Phone: 978-371-6688
FAX Number: 978-371-0098

Primary Operator: John "Erik" Jensen, Small Water Systems Services (SWSS), LLC
Certification: 1D/3T OIT, 12677/27992 respectively
Phone: 978-501-4780

Backup Operator: David "Dave" Bray, Small Water Systems Services (SWSS), LLC
Certification: 2D/2T, 24139/27299 respectively

This Sanitary Survey was conducted on November 12, 2020, by Melika Uter and Zachary Peters of the Massachusetts Department of Environmental Protection ("MassDEP" or the "Department"), John "Erik" Jensen from SWSS, together with Robert Fortado (978-371-2279; rfortado@carlisle.k12.ma.us), the Facilities Manager for the Carlisle Public Schools.

System Classification

Carlisle Public Schools is classified as a Non-Transient, Non-Community (NTNC) public water system (PWS) because the facility has at least 15 service connections or regularly serves at least 25 of the same persons or more approximately four or more hours per day, four or more days per week, more than six months or 180 days per year.

The classification status of the Carlisle Public Schools (the "School") distribution system is a **Class VSS** system because it is classified as a non-community system (NTNC or TNC). The distribution systems for all non-community public water systems are classified as VSS systems.

The PWS is the sole supplier of water for a public K-8 grade school facility. The school is open year-round with up to 600 full time and part time employees and students at the facility during the regular school season. According to the 2019 ASR the School serves a winter population of 725 and a summer population of 150.

They currently close in June and open in the last week of August, with no summer school activities, although some activities may occur on the premises during the summer. During the Covid-19 Pandemic the population at the school has decreased by 15%. During the spring and summer of 2020 the population at the school was at 30 individuals during the day from March 2020 to August 2020. The PWS no longer supplies water to the "Highland Building".

Source:

The current supply consists of a groundwater source, Wilkins Well, 3051004-01G, located behind the Wilkins Building, with a stick-up casing and 24 inch protective steel cage around the wellhead. The well is approximately 400 feet deep, with a Zone I radius of 172 feet that and an Interim Wellhead Protection Area (IWPA) of 467 feet; both based on a pumped rate of 3000 gallons per day [DEP Letter of March 15, 2000]. There are no signs posted indicating the presence of a public water supply. According to a 1988 well pump test document supplied by SWSS the standing water level was listed as 60 feet. However, during the stilling tube install in October 2020, groundwater within the supply well was gauged to be 94.76-feet below top of casing.

Source	Zone I	Interim Wellhead Protection Area (IWPA)	Approved maximum daily pumping limit (GPD)	Well Depth	Intake Depth	Well Construction Info
Wilkins Well, 3051004 -01G	172	467	NA	400 feet	305 feet	8" bedrock well; 8 feet of casing; 2 HP 8 GPM submersible Webtrol pump (Model 202S151B);

Storage/Treatment:

Water from the well, as described above and shown approximately on the attached plans, is transferred by a submersible pump, connected to pitless adaptor and piped into the basement of the Wilkins Building ⇒ two Reduced Pressure Backflow Preventer (RPBP) reduced pressure zone assemblies (RPZs) arranged in parallel (both utilized at the same time) ⇒ 5 micron sediment filter ⇒ two Granular Activated Carbon filters in a lead/lag setup ⇒ a second 5 micron sediment filter ⇒ ultraviolet disinfection ⇒ hypochlorination injection point ⇒ one 2000 gallon atmospheric green steel storage tank and one brown 2346 gallon steel tank (Installed 7/15/2011) coupled together with bottom fed gravity connections (tanks are both filled from the top) ⇒ water in each tank is aerated and recirculated with a recycle pump and is passively vented for removal of CO_2 for corrosion control/pH adjustment [Monitored to maintain a pH of 8.0 – 8.2] ⇒ 2 booster pumps (1 HP; 45 -75 PSI range) with separate water meters ⇒ secondary hypochlorination unit injection point (not currently used but available if necessary) ⇒ 1500 gallon (946 gallons useful range) Reco USA hydropneumatic pressure tank (Installed 7/11/1999) ⇒ distribution. The raw water sample (RW01) tap is located prior to any treatment. The pressure gauge controls the well pump.

Administration:

Does system have certified operator?	Yes ✓	No	N/A
Is certified operator available for emergencies?	Yes ✓	No	N/A
Have Annual Statistics been submitted?	Yes ✓	No	N/A
Have they been completed properly?	Yes	No ✓	N/A
Has Self-Survey, including map, been submitted?	Yes ✓	No	N/A
Has it been completed properly?	Yes ✓	No	N/A
Are records being properly maintained on site?	Yes ✓	No	N/A
Is NTNC Manual available and up-to-date?	Yes ✓	No	N/A

Comments: The Operators, provided on a contract basis, are noted above. The Operator maintains records and is able to be contacted on a 24-hour emergency basis. Emergency Contact numbers are available within the treatment room, in the main office, and also in the Emergency Response Manual kept at the superintendent's office.

Operation and Maintenance:

Have GUI Forms been completed?	Yes ✓	No	N/A
Is any source GUI?	Yes	No	N/A ✓
Is there an adequate spare parts inventory?	Yes	No	N/A ✓
Is there a preventative maintenance program?	Yes	No	N/A ✓
Is there an O & M Manual?	Yes ✓	No	N/A
Is there adequate safety equipment available?	Yes	No	N/A ✓

Comments: A *Ground Water Under The Influence Of Surface Water Non-Community Verification Form To Determine Groundwater Exemption Status* form for Wilkins Well, 3051004 -01G was completed on February 1, 2011, by MassDEP and the well was determined to be exempt; a copy is attached for your records. The operator visits the system once per week and test and record the chlorine residual from the Entry Point via grab sample. The system does not utilize an automated analyzer for chlorine measurement. A Carlisle Public Schools staff person checks the chlorine residual daily in the facilities breakroom. Carlisle Public Schools should document exactly how the school staff documents the chlorine levels and the operator should keep a log of the daily chlorine residual that the school staff conducts and include it on the Chemical Addition Report. Furthermore, the operator should check each week that the daily chlorine residual at the facilities breakroom is within the desired range and does not vary significantly (Table C, Item 1). Carlisle Public Schools is reminded that the anti-siphon device must be inspected yearly and replaced if necessary and document this work on the Chemical Addition Reports.

As detailed in the Source Protection section new treatment has been added in respond to the threat posed by a release of hydraulic oil near the well on June 24, 2019. Two granular activated carbon (GAC) tanks along with two 5 micron sediment filters have been added to the treatment system. The first GAC filter is changed every three months by the operator and the second one every three months or as needed. At the time of the sanitary survey, MassDEP noted that the first 5-micron sediment filter was very loaded with what appeared to be both potential black manganese precipitate and/or sediment. The second 5-micron sediment filter, from after the two GAC vessels, appeared clean. During the sanitary survey MassDEP staff observed that there was a difference in the amount of packed media in each GAC vessel by using a flashlight as a backlight but the operator did not know why (Table B, Item 1). MassDEP recommends that the frequency of the first 5-micron sediment filter change be increased to monthly so the filter does become so loaded as to be less effective.

Treatment:

Are Chemical Treatment Forms being submitted?	Yes __✓__ No _____ N/A ___
Are they completed properly?	Yes __✓__ No _____ N/A ____
Is equipment properly maintained?	Yes __✓__No _____ N/A __
Is there adequate containment?	Yes __✓__ No _____ N/A ___

Comments:
Due to the hydraulic oil release as detailed in the Resource Protection section the water flows through two sediment filters and two GAC vessels. The water first flows through one sediment filter then a GAC vessel then the second sediment filter then the second GAC vessel. The system disinfects utilizing sodium hypochlorite (NaClO) dispensed from a hypochlorination unit with the injection point prior to the atmospheric tanks, and a secondary hypochlorination unit (not currently being used by is available if necessary) with an injection point prior to the pressure tank. Chlorine residual levels are monitored at test tap # 1, located just after the pressure tank. A pH monitor measures and records the pH level in the 1000 gallon gravity tank, with a goal of an average pH of 8.0. Residual monitoring is conducted throughout the system and results are recorded on the monthly chlorination report submitted to DEP. In a given month the chlorine residual can be as low as 0.12 mg/L and as high as 0.46 mg/L and during the spring of 2020 there has been months that the residual has been below 0.10 mg/L. The original chlorination plan approved by MassDEP requires a chlorine residual of 0.24 mg/L to 0.30 mg/L to be maintained out in the system.

There is call-out telemetry to the Town of Carlisle for low pressure and tank levels (<1/2 full) as well as audible alarms for flow, well pump and/or chlorine pump failure. There are no low or high alarms other than the audible alarm on for low/empty chlorine tank but it does not call out. The operator states that the bulk chlorine is very dilute so the concentration would be low if it went out into the system unchecked and would not create a health hazard. MassDEP recommends all call out telemetry be made to both the Town of Carlisle and the operator (Table C, Item 2). There is aeration within the atmospheric tanks for removal of CO_2 for corrosion control/pH adjustment. One point-of-use cartridge water filter is located on the water supply line to the automatic soap dispensing unit for the dishwasher in the Corey Building kitchen. This filter is changed every six months during the school year.

Distribution:

Is there an up-to-date distribution map?	Yes _____ No _____ N/A __✓
Are valve locations shown?	Yes _____ No _____ N/A __✓
Is there an adequate flushing program?	Yes _____ No _____ N/A __✓
Do storage tanks comply with Guidelines?	Yes _____ No _____ N/A __✓

Comments: The system supplies water solely to the users noted above. The 2019 ASR list three active storage tanks: 1) a 2,000 gallon water ground level steel storage tank which was installed on 8/11/1963; 2) a 2,350 gallon water ground level steel storage tank installed on 7/15/2011; 3) a 1,000 gallon hydro-pneumatic steel storage tank installed on 7/11/1999. MassDEP's most recent information regarding comprehensive tank inspection was that the 2,000 gallon water storage tank was last cleaned and relined in April 2010 while the 1,000 gallon water storage tank was cleaned and relined in April 2005. The last sanitary survey report noted that these tanks are on a five year maintenance schedule and that there are potential plans for the replacement of the 1000 gallon tank. Carlisle Public Schools must inspect all three tanks and do any necessary repair work within the recommended timeframes (Table B, Item 2). There is an irrigation system connected to the water supply.

Distribution System Protection – Cross Connections:

Does system have a cross connection program? Yes _✓__ No _____ N/A __
Has Annual Cross Connection Report Form been submitted? Yes __✓_ No _____ N/A __
Has it been completed properly? Yes ____ No __✓__ N/A __

Comments: The Cross Connection Control Program was approved by MassDEP on August 19, 1999. The 2019 ASR indicates that Ms. Deborah Trumbull is the Cross Connection Program Coordinator, John Jensen (Ma Cert. # 32652) as the surveyor and the testers as John Jensen (Ma Cert. # 32652) and Richard Harris (Ma Cert. # 3826, 978-664-1411; email chiefrharris@gmail.com). Weston & Sampson was recently hired to conduct the Cross Connections testing, replacing Triple A as the contractor. This information should be updated in the 2020 ASR along with anything else that needs updating (Table B, Item 3). The most recent cross connection survey was completed on March 1, 2019. Documentation provided by SWSS prior to the onsite sanitary survey provided the following list, shown in the table below, of eight (8) Reduced Pressure Backflow Preventer (RPBP) testable devices that are located at the facility. During the sanitary survey Mr. Fortado provided the most recent device test results from October 2, 2018 to April 22, 2020, documenting that all the devices passed.

	Device Location	Siz/Make/Model	DEP Device ID#	Serial #
1	Corey Building/Cafeteria	¾"Watts/009M3QT	05104004	B30673
2	Grant Bldg. 2nd Floor Room G203	1"Watts/009QT	05104008	49440
3	Grant Bldg. 2nd Floor Room G203 water heater	1.25"Watts/909	05104005	139168
4	Wilkins Bldg./Workshop Top "next to green tank"	1/25" Watts/009M2QT	051040011	42242
5	Wilkins Bldg./Boiler Feed – "near stairs"	1" Watts/009M2QT	05104001	397846
6	Wilkins Bldg./Workshop "Bottom next to green tank"	1.25" Watts/009	051040002	24678
7	Robbins Bldg. Science Tech Room R138	¾"Watts/009M3QT	051040013	375554
8	Robbins Bldg. Science Tech Room R138	¾"Watts/909QTHW	0510400132	34362

Previous ASRs since the last sanitary survey did not accurately report presence of or testing of backflow devices. In the 2019 ASR the 8 devices were listed but not the number of tests. The 2018 ASR listed the 8 devices along with the number of tests conducted (16 routine tests, 2 failures and their resulting repair and re-tests). In 2017 no devices or testing was listed. Devices # 051040002 and 051040011 are currently being run in parallel but only one is needed at any given time. During the sanitary survey it was noted that they both leak. MassDEP recommends steps be taken to manage this with plumbing changes or the use of the backflow unit that is less susceptible to the issue (Table C, Item 3).

Emergency Plans:

Does system have Emergency Response Plan? Yes ___✓ No _____ N/A ___
Are emergency telephone numbers posted? Yes __✓_ No _____ N/A __

Comments: The Emergency Plan is available and was documented at the time of the survey.

Water Quantity:

Does system pump more than 100,000 gpd? Yes _____ No __✓ N/A _____
Does system have Water Management Act
Registration and/or Permit? Yes ___ No __✓___ N/A _____
Is system in compliance? Yes __✓ No _____ N/A _____
Is the water supply adequate? Yes __✓ No _____ N/A _____
Is the source(s) metered? Yes __✓ No _____ N/A _____

Comments: The existing finished water meters, one each on the two booster pumps, are properly located to track all water usage at the facility. As detailed in the Source Protection section there was a hydraulic oil spilled on June 24 2019 within the IWPA of the well that necessitated the well not being used as a potable water source between 8/23/2019 and on 9/17/2019. During this time bulk water was purchased from to supply the school. According, to SWSS there were no records kept onsite of how much water was actually transferred into the drinking water system during each bulk delivery (Table B, Item 4). The approximate volume of water used (does not include the bulk water purchased in 2019) in previous years was:

Year	Well #1 - Yearly Volume Pumped (Gallons)	Maximum/Minimum Monthly Usage Gallons (Month)
2019	671,599***	187,900 (August)*/ 3,700 (November)
2018	742,300****	293,800 (August)**/ 6,100 (December)
2017	571,100	63,100 (March)/ 10, 500 (July)
2016	569,800	62,900 (March)/ 14,300 (July)
2015	583,900	66,500 (June)/ 18,400 (August)
2014	637,800	72,500 (September)/ 9,300 (August)

Correct concentrations: *16,500 gallons, **64,500 gallons, ***449,099 gallons and ****526, 113 gallons.

A discrepancy was noted in the 2018 and 2019 ASRs regarding the amount of water pumped for the month of August in both years. After reviewing their records SWSS determined that in August 2019 Meter 2 (Pump 2) was recording in the beginning of August and then switched over to Meter 1 (Pump 1) towards the end of August. When calculating the reported water volumes the meter read for Pump 2 in August was mistakenly subtracted from the meter read for Pump 1 in July to get the usage value, which resulted in high GPD number; Pump 2 – Pump 1 = Water Usage 2292600 – 2104700 = 187900 gallons. The correct water usage for August 2019 is 16,500 gallons*. The correct calculation is taking August's meter read for Meter 1 (Pump 1) and subtracting July's meter read for Meter 1 (Pump 1). Next, Meter 2 (Pump 2) water usage was calculated by subtracting July's meter read to find its water usage from August's meter read. Finally, to find the total usage, the two water usage values were added together.

SWSS also states that the May 2019 water usage listed in the 2019 ASR was also incorrect. The correct usage for May is 64,500 gallons**. SWSS crossed reference the meter reads their data base and a different usage value was found. To find the usage for May 2019, the meter read from Meter 1 (Pump 1 was on) was used. June's meter read minus May's meter read calculated the correct usage value. Meter 1 (Pump 1) June 2,063,200 - May 1,998,700 = 64,500. Well 2 was not on at this point in time.

Furthermore, Carlisle Public Schools reported in the 2018 ASR that the August 2018 water usage was 293,800 gallons. However, after making a few phone calls and reviewing the meter read data again, SWSS found this value to be incorrect. SWSS thinks that the water usage was mistakenly recorded in liters not gallons. The correct usage should be 77,613 gallons for August 2018's water usage, which at 2,503 gpd, is more in line with the overall average usage (2,000 – 3,000 gpd). Another issue with the meter reads of that month was noted in the ASR as follows: In August, the (previous) operator filled the chemical tank and forgot to put the well back to auto so the extreme water use was due to the well continuously pumping. Also, the previous operator has since retired and not available for questioning regarding these discrepancies. Finally the corrected total water pumped is 449,099 gallons*** and 526, 113 gallons**** for 2019 and 2018 respectively according to SWSS.

Water Quality:

Have there been any violations in past 12 months?	Yes _____	No __✓__	N/A _____
Have they been corrected?	Yes _____	No _____	N/A __✓__
Is disinfection performed as required?	Yes _____	No _____	N/A __✓__
If there was a bacteria violation, has Coliform Violation Eval. Survey been submitted?	Yes _____	No __	N/A __✓____
Is a Complaint Log being maintained?	Yes _____	No _____	N/A __✓__
Is the CR posted?	Yes _____	No _____	N/A __✓__
Do they have a copy of sampling schedule?	Yes __✓__	No _____	N/A _____

Comments: There have been no complaints noted with water quality or pressure. Two bacteria samples are required monthly; a raw water sample (RW01G) from the Wilkins Well collected in the water treatment room, and, a Routine Sample (RS001) from the sink in the Robbins Building Faculty room (R112). At the request of the operator the Coliform Sampling Plan shall be updated using more suitable sites (Table B, Item 5). The Routine Sample (RS001) will be changed from the Robbins Building Faculty room (R112) to the Grant Facilities break room.

In addition to the monthly bacteria testing, it requires the following sampling:

- Nitrate annually in the 1st quarter. Your most recent samples are listed in the table below. Two of the six samples were above the Minimum Detection Limit (MDL) concentration of 0.05 mg/L but all were below the Massachusetts Maximum Contaminant Level (MMCL) of 10 mg/L;

Date	Concentration (mg/L)
01/12/2016	ND
07/18/2016	ND
01/10/2017	0.09
01/10/2018	ND
02/27/2019	ND
03/06/2020	0.18

- Nitrite triennially in the 1st quarter with your next sample in 2023. Your most recent samples taken on 01/10/2017 and 03/06/2020 both had non-detectable (ND) levels of nitrite (MDL=0.02 mg/L) which is well below the MMCL of 1 mg/L.
- Volatile organic compounds (VOCs) since the last sanitary survey have sampled annually in the 3rd quarter. However, starting in 2020 VOCs will be sampled quarterly as a result of hydraulic oil release. Your most recent samples taken on 10/13/2020 all had non-detectable (ND) levels for all compounds except for; Bromoform at 0.7 ug/L; Chloroform at 0.7 ug/L; Chlorodibromomethane at 0.6 ug/L.
- Sampling for compliance with the Lead and Copper Rule is done triennially from 10 approved locations. The 90th Percentile for both lead and copper from 2016 to 2019 are listed in the table below. The action level is 0.015 mg/L for lead and 1.3 mg/L for copper. All were below the action level for both lead and copper;

Year	Lead (mg/L)	Copper (mg/L)
2016	0.008	0.177
2019	0.005	0.155
2020-Spring	0.004	0.418

- Perchlorate annually in the 3rd quarter. Your most recent samples, since the last sanitary survey, taken on 07/18/2016, 07/10/2017, 07/16/2018, 08/21/2019 and 8/11/2020 both had non-detectable (ND) levels with an MDL of 0.05 ug/L, which is below the MMCL of 0.002 mg/L;
- Manganese had a sampling waiver from 2014 to 2016 but since 2018 you have been required to sample triennially. However, the School samples annually for secondary contaminants and so manganese is sampled annually through this protocol. Your most recent sample taken 03/06/2020, had a non-detectable (ND) level which is well below 0.30 mg/L, the MassDEP Office of Research and Standard Guidance Level (ORSGL) for manganese;
- Synthetic organic compounds (SOC) are required triennially in the 3rd quarter and will next sample in 2021. Your most recent samples taken on 07/16/2018 all had a ND levels;
- Inorganic compounds (IOC) are required triennially in the 3rd quarter and will next sample in 2022. Your most recent sample taken on 08/21/2019, all had non-detectable levels for all compounds except: sodium at 20.3 mg/L which is above the ORSGL of 20 mg/L for sodium; fluoride at 0.1 mg/L which is below the MMCL of 4 mg/L; barium at 0.008 mg/L which is below the MMCL of 2 mg/L. MassDEP requires that public water suppliers notify local Boards of Health and the Massachusetts Department of Public Health when sodium levels in public water supplies exceed the guideline. The sodium notification form and a fact sheet are both available on the MassDEP web site at: *http://www.mass.gov/dep/water/drinking/sodguide.doc* ;
- You have been granted a waiver to not do arsenic sampling and it is not listed on the current Sampling Schedule for 2020 to 2022; and
- DEP recommends annual testing for secondary contaminants which the School does on an annually basis.
- Trihalomethanes are required annually in August of each year; sample taken at Robbins Building Room 132. Your most recent sample taken on 08/14/2018, 8/21/2019 and 8/11/2020 had concentration of 7.88 ug/L, 23 ug/L and 4.74 ug/L respectively. All were below the MMCL of 80 ug/L for Total Trihalomethanes. [Sum of the concentrations of bromodichloromethane, bromoform, dibromochloromethane and chloroform];
- Halocetic Acids are required annually in August of each year; sample taken from Robbins Building Room 132. Your most recent sample taken on 08/14/2018, 8/21/2019 and 8/11/2020 had concentration of non-detectable, 1.69 ug/L and non-detectable respectively. All were below the MMCL of 60 ug/L for Halocetic Acids. [Sum of the concentrations of mono-, di-, and trichloroacetic acids and mono-and dibromoacetic acids];

Resource Protection:

Did the PWS receive a SWAP report?	Yes ✓ No ___ N/A _____
Is the SWAP report and Map correct?	Yes ✓ No ___ N/A ____
Has there been any follow-up on the SWAP Recommendations?	Yes ___ No _____ N/A ✓
Is the Zone I owned or controlled?	Yes ✓ No ____ N/A _____
Are source water protection measures adequate?	Yes _____ No ✓ N/A _____
Is watershed inspected regularly?	Yes _____ No _____ N/A ✓
Are there any known, or potential, sources of pollution?	Yes ✓ No _____ N/A _____
Is protection area posted?	Yes _____ No ✓ N/A _____
Is UIC assistance needed?	Yes _____ No ✓ N/A _____

Comments: The Zone I (172 foot radius) contains school buildings, access roads, parking areas, and a dumpster by the loading dock. The IWPA (467 feet) also contains portions of the sanitary sewer system which in addition to regular sanitary sewage may take discharges from the school's chemistry and photography laboratories. The actual waste water treatment plant and associated leaching facility is located at 304 Bedford Rd. (on the Banta-Davis property) approximately 2000 feet east of the Wilkins Well. All portions of the facility are heated by gas. As noted to School in the Department's approval letter of August 20, 2010, a proposed building addition includes half of the new building within the Zone I. These 1,494 square feet of building and new paved areas within Zone I that would be rendered impervious will be offset by 1,861 square feet of existing pavement that will be converted to a grassy area. Staging, storage, and refueling of earthwork machinery during the construction phase will all be located outside of the Zone I. Storm water infiltration will be located outside of Zone I. There is also a transformer on the east side of the Wilkins Building to the south side of the Grant Building. The transformer is outside of the 172-foot Zone I radius.

As noted to you in the Department letter of August 20, 2010, in regard to the new building construction, any increased withdrawals from Well #3051004-01G above the authorized volumes may increase the radius of the Zone I and therefore place you in non-compliance with MassDEP's requirement, 310 CMR 22.21(3)(b), that Zone I activities be limited to those directly related to the provision of public water or will have no significant adverse impact on drinking water quality. Pursuant to 310 CMR 22.04(1) and 310 CMR 22.21(1)(a), the owners or designated representatives of Carlisle Public Schools must notify MassDEP prior to any change that can impact the quality or quantity of the drinking water supply and any owners must obtain MassDEP approval prior to modifying or expanding the facility. MassDEP may not approve any proposed modifications or expansions resulting in water withdrawals that exceed the current pumping rate and/or usage.

On June 24, 2019, at approximately 12:30 pm there was a release of hydraulic fluid inside an elevator shaft located on the school property according to Facility Manager, Mr. Robert Fortado. Mr. Fortado then contacted Mr. Gregory Morand of OEG who reported a spill to MassDEP at approximately 12:54 PM. A Do Not Drink Order was issued on July 31, 2019 by a contractor for Carlisle Public School. The release reportedly occurred due to a malfunction in the hydraulic piston used to raise and lower the elevator. The location of the release is approximately 220 feet from the supply well in an open bedrock elevator shaft. Once the release was confirmed, Immediate Response Actions were initiated under the supervision of a Licensed Site Professional (LSP) and based on assessment and recovery activities it was determined that approximately 25 gallons of hydraulic oil had been lost during the release.

As a result of this hydraulic oil release within the IWPA of the Wilkins Well, water samples were collected from the well and tested for Total Petroleum Hydrocarbons (TPH). The results showed that the TPH levels

were above expected background levels in some of the samples collected. Supplemental water quality monitoring was also conducted which identified the presence of radon and uranium in the water of the well at a concentration of 1820 pCi/l (10,000 pCi/l ORSG) and 23.4 ug/L (MCL is 30 ug/L) respectively for radon and uranium. Uranium concentration is more than 75% of the MCL. There was a follow-up Uranium sample taken in December 2020 and had a concentration of 18 ug/L. As such, MassDEP required the school to install a treatment system specifically designed for the removal of uranium/radionuclides. On 7/30/2020 the MassDEP Drinking Water Program approved a permit for the Uranium Treatment System. The uranium will be removed using an ion exchange system which will consist of two pressure vessels containing an ion exchange media. The two treatment vessels will be installed in series, so that any water from the well would pass through both vessels. This system will be installed prior to the Granular Activated Carbon point of entry treatment (GAC POET) system to reduce the levels of uranium/radionuclides that may be adsorbed to the GAC and reduce its effectiveness. Subsequent to the sanitary survey site visit, SWSS communicated that they were unsure if the Uranium Treatment System was going to be installed. Carlisle Public Schools shall provide MassDEP with an updated plan for installing the Uranium Treatment System (Table B, Item 6). Furthermore, Carlisle Public Schools shall test for Uranium in the first quarter of 2021, this sample can be part of the radionuclide start-up (both raw and finish water samples) (Table B, Item 7).

Due to the hydraulic oil spill, between 8/21/2019 and 9/17/19 the PWS provided bottled water and had 8 bulk water deliveries. Further, emergency response activities were conducted to mitigate and stabilize the oil release. These emergency response included the removal and off-site recycling of six 55-gallons drums of petroleum contaminated soil from the elevator casing, disposal of 583 gallons of petroleum impacted groundwater, installation of the GAC POET system noted above. Additionally, there has been four bedrock (two interior and two exterior) monitoring well installed along with geophysical borehole/logging of the elevator shaft and one of the exterior monitoring wells. There has also been an assessment of the impacted soil, groundwater, and drinking water involving sample collection and laboratory analysis. Results of a pump test were submitted to MassDEP in January 2021. The table below list the concentration of TPH in the Wilkins Well. 8/12/2019-1 was a grab sample, 8/12/2019-2 was collected after the Well was purged for 30 minutes prior to sample collection and 8/12/2019-3 was collected after the Well was purged for 30 minutes prior to sample collection.

Date	Well	TPH Concentration (ug/L)	ORSG (ug/L)
7/8/2019	Wilkins	**227**	200
8/1/2019	Wilkins	**290**	200
8/2/2019	Wilkins	**200**	200
8/12/2019-1	Wilkins	190	200
8/12/2019-2	Wilkins	190	200
8/12/2019-3	Wilkins	**200**	200

Schedule for Corrective Actions - To be in compliance with applicable regulations and rules, the following work contained in the Sanitary Survey Compliance Plan below must be performed by the completion date noted. The dates for completing actions indicated in the table below are required actions. If the Public Water Supplier does not complete notification to MassDEP within the designated time, the Department may take enforcement actions. (T-Technical, M- Managerial, F-Fiscal):

Technical Assistance:
Were Training Contact Hours (TCHs) given? Yes _____ No _____ N/A __✓__

What is the priority of this system for follow-up?
Technical Assistance High ____ Med __✓__ Low ___

I hereby acknowledge receipt of this TNC Sanitary Survey conducted by the Department of Environmental Protection's Drinking Water Program.

For the Public Water System:

_____ _____
(Signature) (Title)

_____ _____
(Printed Name) (Date)

For the Department of Environmental Protection:

_____ ____Environmental Analyst_____
(Signature) (Title)

_____Melika Uter_____ _____
(Printed Name) (Date)

SANITARY SURVEY COMPLIANCE PLAN

SECTION A – VIOLATIONS
This compliance plan is not included as part of a Notice of Noncompliance.

T/F/M	Ref #	Deficiencies*	Corrective Action(s)	Requested Corrective Action Date
NA	NA	NA	NA	NA

NA=Not Applicable

SECTION B – DEFICIENCIES

Deficiencies should be addressed in order to improve the protection of drinking water and the public health. MassDEP/DWP will provide technical assistance to systems responding to these deficiencies. Unless addressed, deficiencies may jeopardize the safety of the drinking water supply system.

T/F/M	Ref #	Requirements/Deficiencies*	Corrective Action(s)	Requested Corrective Action Date
T	1.	310 CMR 22.03(15) To properly carry out its responsibilities …. the Department and its authorized agents and representatives may request information from any Person as it deems necessary to ascertain the purity and fitness of water supply for domestic use, or the possibility of the water supply Distribution System imperiling the public health, or to evaluate whether that Person is subject to, in compliance with, or in violation of, M.G.L. c. 111, § 160, or 310 CMR 22.00.	Carlisle Public Schools shall determine the reason for the observed difference in the amount of packed media in each GAC vessel and notify MassDEP of the reason(s) in a letter and correct the issue if necessary.	3/1/2021
T	2.	Guidelines 8.1.22(2) Maintenance: The exterior and interior of every finished water atmospheric storage tank shall be inspected as specified below. A thorough interior and exterior structural	Carlisle Public Schools shall conduct comprehensive storage tank inspection of the two atmospheric tanks in the system and then submit a letter certifying the tank inspection has been completed in accordance with Chapter 8 of the Guidelines along with the reports.	6/1/2021

		and coating inspection shall be conducted every 3-5 years by qualified and experienced personnel.		
M	3.	310 CMR 22.03(15) To properly carry out its responsibilities …. the Department and its authorized agents and representatives may request information from any Person as it deems necessary to ascertain the purity and fitness of water supply for domestic use, or the possibility of the water supply Distribution System imperiling the public health, or to evaluate whether that Person is subject to, in compliance with, or in violation of, M.G.L. c. 111, § 160, or 310 CMR 22.00.	Carlisle Public Schools shall update their cross connection information (testing contractor etc) in the 2020 ASR.	4/30/2021
M	4.	310 CMR 22.03(15) To properly carry out its responsibilities …. the Department and its authorized agents and representatives may request information from any Person as it deems necessary to ascertain the purity and fitness of water supply for domestic use, or the possibility of the water supply Distribution System imperiling the public health, or to evaluate whether that Person is subject to, in compliance with, or in violation of, M.G.L. c. 111, § 160, or 310 CMR 22.00.	Carlisle Public Schools shall provide the amount of bulk water purchased to correctly represent the amount of water purchased in the 2019 ASR (information on how to do so is attached) and submit it to MassDEP.	3/1/2021
M	5.	At the time of the Survey it was requested by the operator to update the existing Coliform Sampling Plan.	Carlisle Public Schools shall sign, return to MassDEP, and implement the attached revised Coliform Sampling.	2/1/2021
M	6.	310 CMR 22.03(15) To properly carry out its responsibilities …. the Department and its authorized agents and	Carlisle Public Schools shall provide MassDEP with an updated plan for installing the Uranium Treatment System.	3/1/ 2021

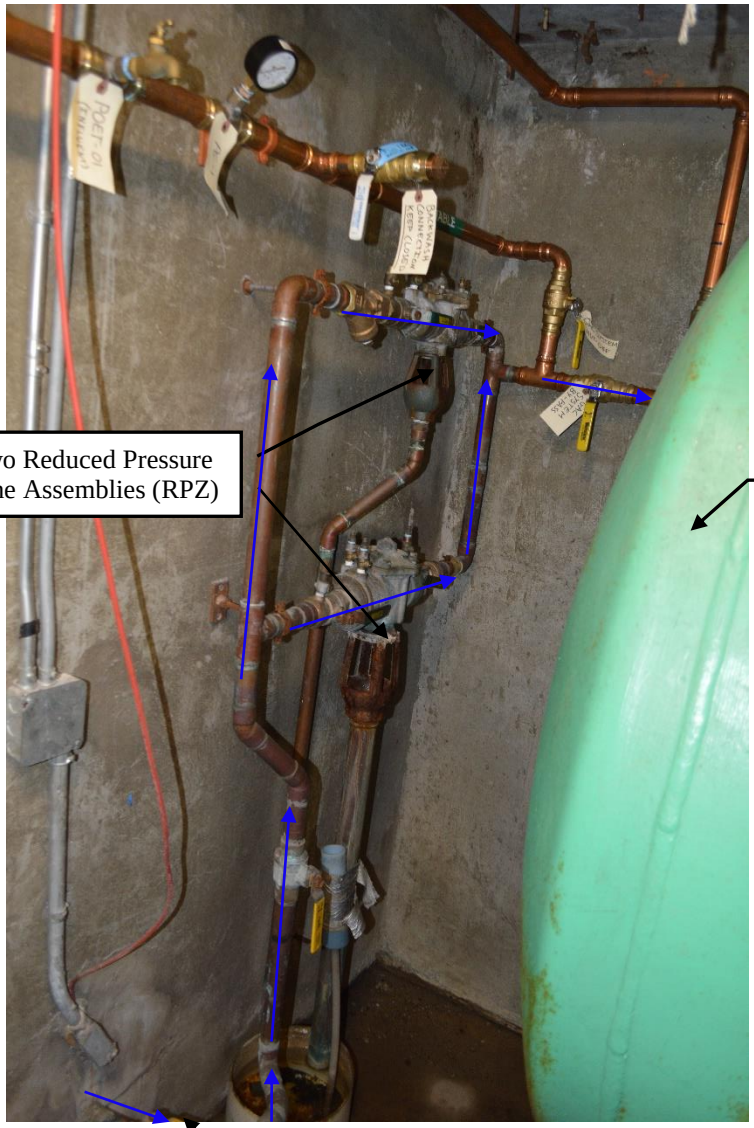
		representatives may request information from any Person as it deems necessary to ascertain the purity and fitness of water supply for domestic use, or the possibility of the water supply Distribution System imperiling the public health, or to evaluate whether that Person is subject to, in compliance with, or in violation of, M.G.L. c. 111, § 160, or 310 CMR 22.00.		
M	7.	310 CMR 22.03(2) A Supplier of Water, upon request by the Department, shall sample and analyze its water for any parameter, at any location and frequency, deemed necessary to prevent the pollution of and secure the sanitary protection of waters used as sources of water supply and to ensure the delivery of a fit and pure water supply to all consumers, in accordance with 310 CMR 22.00. All results of such sampling and analysis shall be reported to the Department as directed and in accordance with 310 CMR 22.00. A Supplier of Water that fails to report such results to the Department as directed, and in accordance with 310 CMR 22.00, shall be presumed to have f ailed to conduct such monitoring.	Carlisle Public Schools shall test for Uranium in the first quarter of 2021 and submit the result(s) to MassDEP.	April 10, 2021

SECTION C – RECOMMENDATIONS

Recommendations should be addressed to improve the protection of drinking water and public health. DEP/DWP will provide technical assistance to systems responding to these recommendations. Please call your regional DWP office for referral to the appropriate staff person.

T/F/M	Ref #	Identified Concern	Corrective Action
M	1	A Carlisle Public Schools staff checks the chlorine residual daily in the facilities breakroom but it is not reviewed by the operator.	MassDEP recommends that the operator should follow each week by checked that the daily chlorine residual from the facilities breakroom does not change significantly.
M	2	.All call-out pertaining to the drinking water treatment system is made to just the Town of Carlisle.	MassDEP recommends all call out to be made to both the Town of Carlisle and also to the operator.
T	3	Cross Connection Device # 051040002 and 051040011 are currently being run in parallel but only one is needed at any given time. During the sanitary survey it was noted that they both leak.	MassDEP recommends closing one of the two Reduced Pressure Backflow Preventer (RPBP) reduced pressure zone assemblies (RPZs) at the beginning before the hypochlorination injection point.

Photos taken November 12, 2020



First 5 micron sediment filter

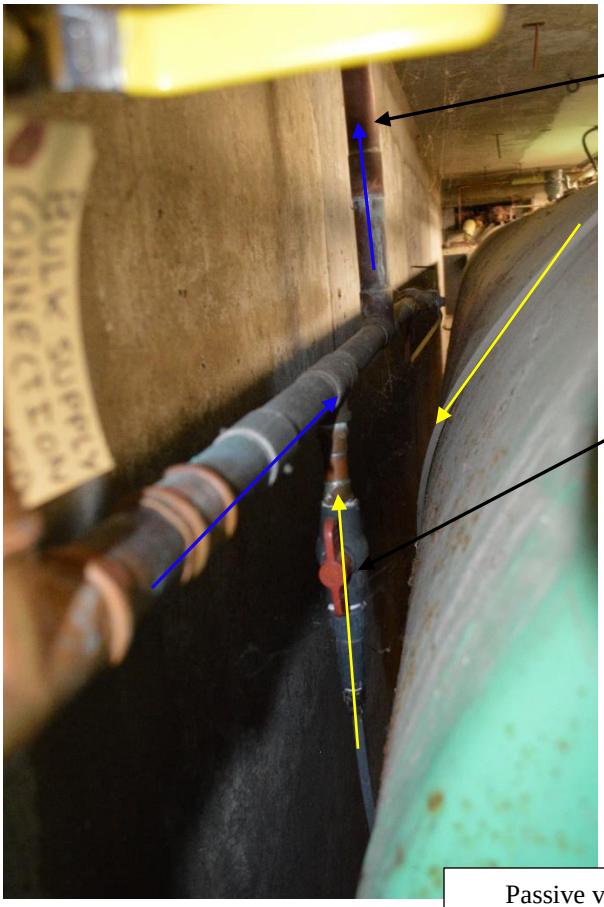
First GAC filter

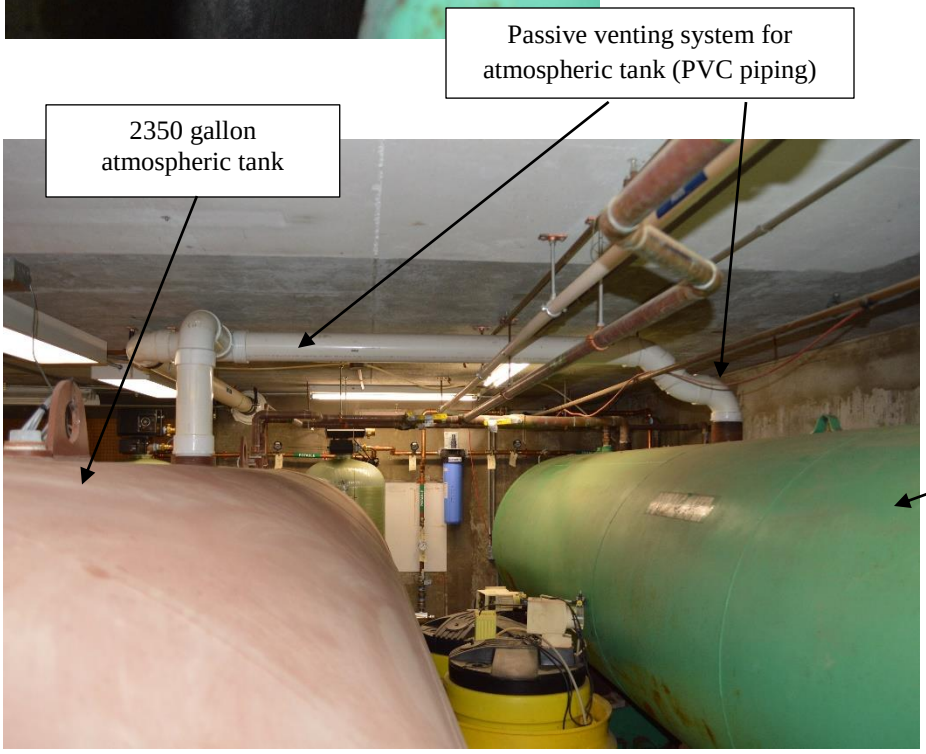
Second 5 micron sediment filter

Second GAC filter

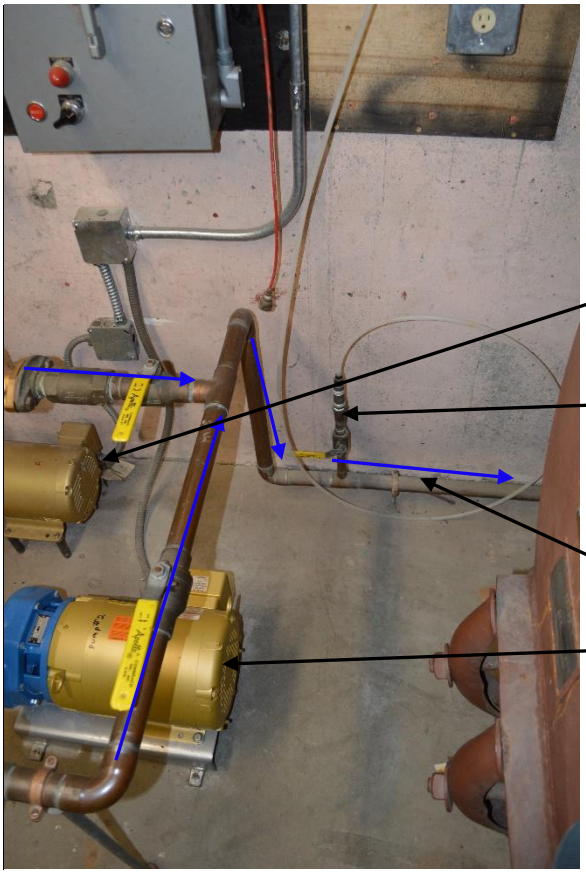
Ultraviolet Disinfection

Primary hypochlorination unit


Tank fill line
Primary hypochlorination injection port prior to atmoshperic storage


Passive venting system for atmospheric tank (PVC piping)
2350 gallon atmospheric tank
2000 gallon atmospheric tank

Water line from atmospheric green tank



Booster Pump 1

Secondary chlorine injection point

Water line to pressure tank

Booster Pump 22

1500 gallon pressure tank

Distribution line to school

pH meter and recorder

Bubblers in Spalding Building

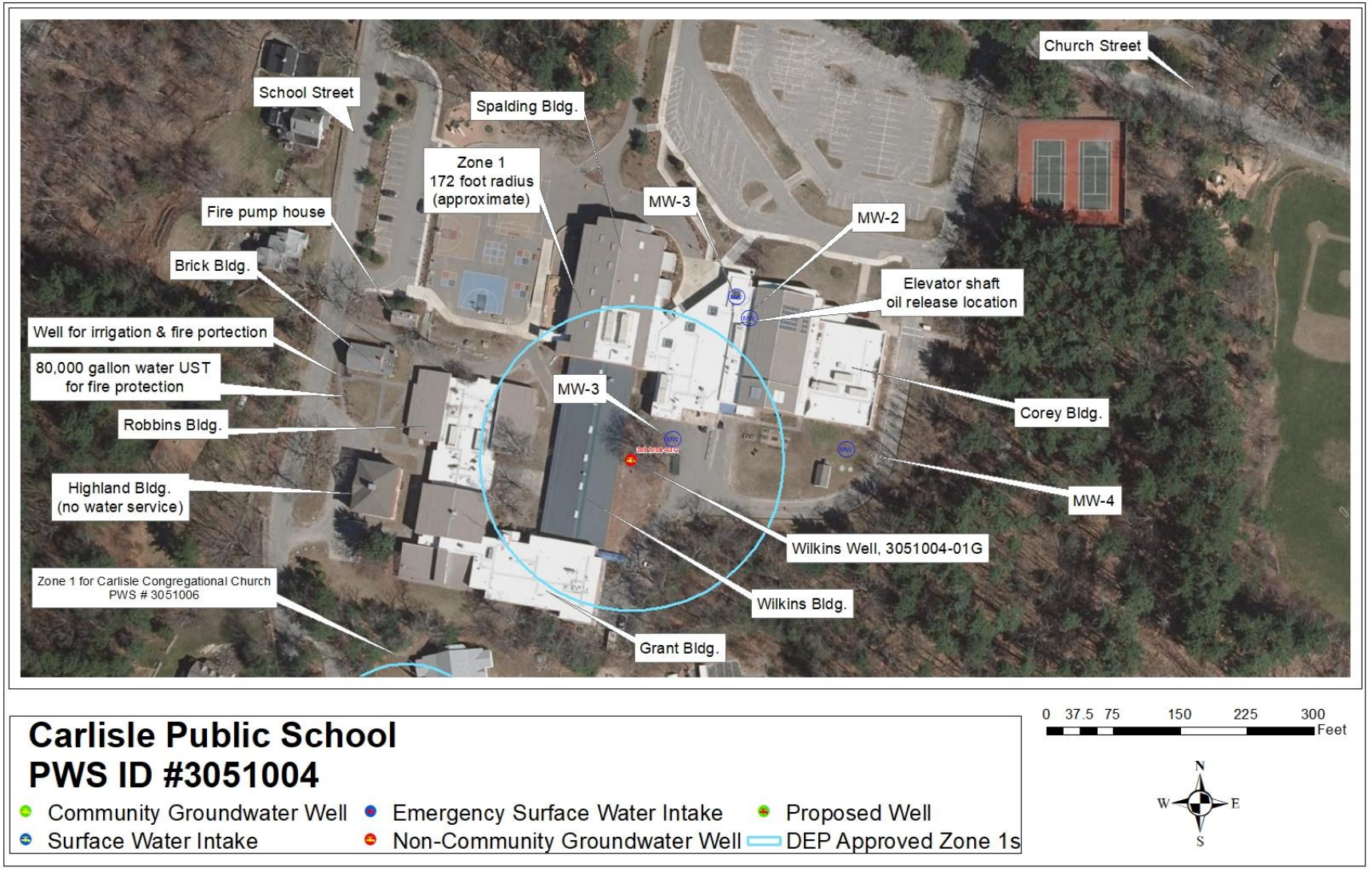
Wilkins W121
Faculty & Staff

Brick Building
bathroom

Brick Building
utility sink

Grant Facilities
Breakroom

Highland Building
no water service


Church Street
School Street
Spalding Bldg.
Zone 1
172 foot radius
(approximate)
MW-3
MW-2
Fire pump house
Brick Bldg.
Elevator shaft
oil release location
Well for irrigation & fire portection
80,000 gallon water UST
for fire protection
MW-3
Corey Bldg.
Robbins Bldg.
Highland Bldg.
(no water service)
MW-4
Wilkins Well, 3051004-01G
Zone 1 for Carlisle Congregational Church
PWS # 3051006
Wilkins Bldg.
Grant Bldg.
Carlisle Public School
PWS ID #3051004
Community Groundwater Well
Emergency Surface Water Intake
Proposed Well
Surface Water Intake
Non-Community Groundwater Well
DEP Approved Zone 1s
0 37.5 75 150 225 300
Feet
N
W
E
S