

New Fairfield HS Gas Smell Narrative

5-1-24

The following is a narrative describing the process for initial activation and corresponding evaluation of the gas piping in the new building. It should be noted that the gas issue has been a focus of the design and construction team with routine updates to the District administration, permanent building committee and at the bi-weekly Owner Contractor Architect (OAC) meetings.

As part of the construction sequence and prior to substantial completion and building turnover, the propane lines were purged with nitrogen gas to evacuate the pipes. After purging the new pipes, the system was filled with propane and the system was reviewed by the authority having jurisdiction (AHJ). The initial review noted that propane with odorant (the egg type smell) was present at the science rooms, culinary lab, and kitchen. Propane is an odorless gas; an odorant (Mercaptan) is added to the propane to alert the user of the presence of propane.

Between the start of school and the **middle of October** the school staff raised the concern that there was a lack of propane smell in the science rooms. The Fire Marshal inspected the school and noted that the propane had odorant on the first floor (kitchen and culinary rooms) and on the second floor (2 science rooms). The Fire Marshal did not detect odorant in the three third floor science rooms. It was assumed that the perceived lack of odorant for safe operation was due to limited use and with new piping the smell can diminish unless it experiences steady use. Through research performed by the design and construction team it was believed that an increased use of gas would "Pickle" the pipes so the pipes would stop leaching odorant from the mostly static gas. This is not an exact science and the time to pickle pipes can vary greatly depending on use.

The week of **October 23, 2023**, the Construction manager O&G Industries set up Bunsen burners in the science rooms in an attempt to burn additional propane restoring the required smell.

On or about **November 1, 2023**, Colliers Project Leaders (CPL) discussed this issue with Mitchell Propane (the propane supplier) and they stated that they had never experienced this issue before. Mitchell recommended purging the lines again with nitrogen and reintroducing propane.

On **November 7, 2023**, with the assistance from the science department, O&G and CPL burned (12) Bunsen burners in each of the following classrooms, 302 (3 hours), & 304 (4 hours). O&G and CPL staff noted that the perceived odorant was stronger after the usage but was not accepted by the Fire Marshal.

At the **November 10, 2023**, working group meeting, there were two courses of action discussed to resolve the lack of consistent odor. The first option would involve continuing to burn propane through the use of Bunsen burners under controlled situations which would pickle the pipes over time. The second option recommended by Mitchell Propane required purging the lines and reintroducing the propane. According to NIOSH (National Institute for Occupational Safety and Health), the purging of the lines may remove any pickling of the pipes that had taken place to date.

On **November 14, 2023**, after the Owner project meeting, O&G and CPL confirmed that there was some level of odorant present in the third-floor science rooms but was not significant compared to first floor areas.

On **November 22, 2023**, CPL coordinated with the School and O&G industries to burn (12) Bunsen burners in each of the following classrooms, 302, 304, & 312. (3 hours each classroom)

On **November 28, 2023**, CPL requested that the Fire Marshal reinspect the science classrooms for the odorant.

On **November 30, 2023**, CPL and O&G industries met with the Fire Marshal to inspect rooms 312, 302 and 304. The Fire Marshal had a faint smell of odorant in rooms 302 & 304, but the odorant was not consistent. The Fire Marshal did not detect odorant smell in room 312. The inspections moved to the second floor and the odorant was not present in either of the science classrooms. The Fire Marshal then inspected the culinary classroom and kitchen, both locations had a consistent but faint odorant smell in both locations. The inspection moved to the exterior underground propane tanks and odorant smell was confirmed at the bleeder valve. The bleeder valve is used during the filling of the tanks to let the worker know that the level of the tank is full. The location of the bleeder valve is at approximately 80% of the volume of the tank. CPL contacted Hygenix, the project's environmental engineer, to provide air sampling as requested by the Fire Marshal.

In addition to the lack of odorant, when the team inspected room 202 water came out of both gas turrets at the left rear table (northeast table). The Fire Marshal directed the gas to be shut off to the school.

On **December 1, 2023**, CPL met on site with the plumbing contractor, O&G and Fire Marshal to reinspect the kitchen and culinary classroom and both locations had a consistent faint odor. The team investigated the source of the water in science room 202 and it was confirmed that there was water in the gas piping which was isolated to room 202. The plumbing contractor opened the low point for room 202 and drained the water. The plumbing contractor proceeded to open all six of the lab tables low point drains for the science tables in room 202 and found evidence of water in 5 out of the 6 tables. The plumbing contractor found no water in any of the propane lines in the remaining second floor and third-floor science rooms.

On **December 4, 2023**, CPL reached out to Linc Energy Systems, Lakewood, Colorado, leading distributor of GPL odorizers and spoke with a representative regarding the situation with the propane. Their initial reaction was that the pipes needed to be pickled and that they work with other companies in the Northeast that are capable of pickling the pipes. CPL spoke with Ngek Phinit, from Mitchell Propane who confirmed that they have not had this issue with any of their other customers. Similar to previous discussions Mitchell recommended purging the lines and then refilling. In addition, O&G contacted the following companies for assistance with little success due to the fact that these companies do not provide the product to New Fairfield.

- Hoffman Energy
- Leahy's Fuel
- Jennings Oil & Propane
- Paraco

- Petro
- AmeriGas
- Hocon
- New England Propane
- Connecticut Propane & Petroleum

On **December 5, 2023**, Hygenix (the districts environmental consultant) conducted sampling of the propane using a single gas detector for mercaptan. Hygenix sampled science rooms 302, 304, 202, and 204 and could not obtain a sample that registered the mercaptan odorant. The kitchens remained shut down with the gas shut off and the pilot lights for the kitchen equipment were extinguished.

On **December 6, 2023**, CPL, and the Fire Marshal, using a single gas detector, tested the underground storage tanks (UST) for the presence of odorant. The samples were taken off the bleeder valves of the tanks which results in a sampling of the liquid propane. We obtained readings of 5.05 ppm of Mercaptan for the north tank and 2.51 ppm for the south tank. The industry standard is a range between 2.5 and 5.0 for acceptable levels, which is subjective.

On **December 7, 2023**, the Fire Marshal asked Leahy's Fuel to take odorant readings of the underground storage tanks. Leahy's took their samples using a piece of equipment called an Odorator. The sample was taken from the propane line that runs into the building before the regulator which is past the tank bleeder valve location where the tests were taken on the previous day. Testing at this location outside of the tank results in the testing of the gas vapor itself which is no longer in a liquified state. They were unable to detect any odorant in the propane, see the attached report dated December 7, 2023.

On **December 8, 2023**, Mitchell Propane took readings of the underground storage tanks using an Odorator from the propane line that runs into the building before the regulator which is the same location that Leahy's sampled the previous day. Mitchell initial reading from the north UST was 0.53. Mitchell then "bled" air off the top of both tanks and took additional Odorator readings. The north UST reading was 0.44 and the south UST was 0.42. This is a different criterion from the tests taken on December 6, 2023, which were calculated in PPM. The December 8, 2023, tests are percent of LEL (lower explosive limit) and the acceptable level is 0.50 and below.

At this point, it was not clear to the team if lack of odorant was being caused by the underground storage tanks or the leaching of the odorant in the new pipes. To eliminate one of the variables temporary tanks were installed by Leahy's Fuel and piped into the building using the existing piping. The temporary tanks were installed on **December 12, 2023**. By computation of the volume of the pipe in the building and the use of the kitchen equipment it would take between 35-38 hours to burn off the existing gas in the piping before the new gas from Leahy's would reach the kitchen equipment. This computation did not account for the length of the exterior piping. Leahy's visited the site on Friday afternoon, **December 15, 2023**, and could not detect any odorant in the kitchen and shut the tanks off. Leahy's removed their tanks from the school on December 19, 2023.

On **December 28, 2023**, Mitchells performed a full building purge with nitrogen and then reintroduced propane from their own temporary propane tanks installed. The temporary tanks

were installed bypassing the underground storage tanks (USTs) and piped using the existing piping to the building. The kitchen and culinary classrooms were brought online and mercaptan odor was present and acceptable to the Fire Marshal and that equipment was placed back in operation. The science rooms were put on hold until the odorant readings could be taken. Mitchell opened available pipes in a science lab and the kitchen to inspect the piping for corrosion. There was no visible corrosion.

On **January 15, 2024**, CPL coordinated with the school and O&G industries to set up Bunsen burners in four of the science classrooms. 204 (2.5 hours), 302 (4.5 hours), 304 (4.5 hours), and 312(4.5 hours). Mitchell was scheduled to sample the propane in the science rooms.

On February 12, 2024, Mitchell Propane took Odorator readings, with the Fire Marshal present. Room 302 was tested and the reading was 0.19, which is within the acceptable level of below 0.50. The Odorator reading in room 204 was 0.26. Mitchell furnished their report via email on **February 27, 2024**, which was forwarded to the Fire Marshal for review. Because the February 12, 2024, testing that showed acceptable readings was taken by the gas supplier, on **March 5, 2024**, the Fire Marshal requested a third party test the propane. A propane consultant, Silverback Consulting Group, LLC, was referred to the Town Fire Marshal by the former State Fire Marshal. Chris Keyser, LLC was recommended to the Town Silverback to independently validate the readings taken by Mitchell. The proposal for the Chris Keyser, LLC was presented to the Building Committee on **March 12, 2024**, and approved. The scheduling of the sampling was delayed due to the negotiations of the contractual release between the Town and Chris Keyser, LLC.

On April 17, 2024, The third-party sampling took place during spring break by Chris Keyser. The Fire Marshal was present for the sampling. Using a DTEX odorant detection system, similar to the previously used Odorator, samples were taken in the science classrooms. No odorant was detected. The kitchens that were running off the temporary tanks since December 28, 2023, were also tested. Again, no odorant was detected. Sampling was then performed at the temporary tanks and the underground storage tanks. No odorant was detected in the temporary tanks. Odorant was barely detected at the south underground storage tank. Chris Keyser, LLC findings letter is attached. All systems were shut down due to the lack of odorant.

On **April 22, 2024**, the team met with Silverback Consulting, Amp Tech (vapor distribution specialist), and Chris Keyser, LLC. Due to the lack of odorant detected in the tanks during the April 17, 2024 sampling, the consultant recommended evacuating the propane from the two underground storage tanks, purging the tanks and then reintroducing propane with a higher concentration of mercaptan into the tanks, and running the high dosed propane through the system. Amp Tech visited the site in the afternoon of April 22, 2024, to review the current conditions and provide a scope of services for performing the consultant's recommendations. While he was onsite, he was able to detect, by smell, odorant in the two temporary tanks and the two underground storage tanks.

Mitchell Fuel was notified of the **April 17, 2024**, sampling results and performed their own odorant sampling on **April 26, 2024**. Mitchell Fuel took samples from the two temporary tanks and two underground storage tanks. The readings were acceptable and ranged from 0.34 - 0.47,

Due to the varied results of the sampling, the Town Fire Marshal has requested detailed analysis of the propane currently in the system. Silverback recommended firms to take the sampling. Propane samples will be taken from the two underground storage tanks, a science classroom, and the culinary kitchen. The sampling is being scheduled for the week of **May 6, 2024**.

Next steps (pending the results from the testing scheduled for the week of May 6, 2024)

1. If the lab results show there is no mercaptan at the two underground tanks, kitchens and science classrooms. The underground tanks will be evacuated of the propane currently in the tanks, the tanks purged to remove any moisture in the tanks. The tanks would then be filled with propane with a double dose of mercaptan and then the system be filled again and tested to confirm there is the required small of gas during operation. -
2. If the lab results show there is mercaptan in the underground tanks but it is lost in the building, the underground tanks will be evacuated (but not purged) of the propane currently in the tanks because the results eliminated the tanks as the issue and the focus would be on the piping. The tanks would then be filled with propane with a double dose of mercaptan. The interior piping would be purged and the building systems re-filled with the double dose gas. The gas would be then tested at all locations to confirm that the required gas smell has been achieved.