

## Case 1. Problems with Lead/Water Sampling Data

### Part I

Jessie is a young, recent civil engineering graduate who has been hired by a state DNR to join their water quality staff. She is supervised by John, a long-time DNR water quality engineer with a PE license. He has experience in the region of the state where Jessie has been assigned, because he has rotated through that area himself. He explains to her that the small communities in this region have well-established public water utilities that have been conducting triennial monitoring of their water for many years. While several of the communities show tests where the 90<sup>th</sup> percentile for lead concentrations is over 5 ppb, they only rarely have seen unusual spikes as high as 15 ppb. The population in the area was once larger, but after some factories closed, the population has shrunk down to predominantly retired people and those with vacation homes that sit empty for months at a time. There are some young families who own homes in the lower-income housing in a few of the towns. He notes that none of these people would want the higher water bills that would come with a corrosion control system. They do have a number of older homes and a network of lead service lines, resulting in water quality that often just barely passes the compliance level.

He explains to her that the public water utilities for the most part are doing the best they can to balance the regulatory compliance needs against their desire to maintain the public trust while keeping water bills affordable. He emphasizes that these water utilities assume that they have a relationship with the DNR based on long-term mutual respect. He cautions her to work on maintaining the trust that has existed for so many years. He gruffly adds: “Sometimes new engineers seem to come into this area expecting to see problems, somehow just looking for trouble – they might push for action level exceedences where it isn’t really warranted. That extra monitoring can arouse suspicions within a community that will take years to overcome.”

With that advice, Jessie begins to study the DNR’s past paperwork for her region, and the test data for the Town of Murray catches her eye. Murray has a public water utility that serves 10 to 12,000 people. It isn’t very clear how many lead service lines they have, but some of the files suggest 500 to 600 lead service lines that have been in place over 80 years. She notices that this water utility does not have a corrosion control system in place. She finds records of their triennial tests – these are the 90<sup>th</sup> percentile values for lead:

2016: 1.21 ppb (or 0.00121 mg/L)  
2013: 7.23 ppb (or 0.00723 mg/L)  
2010: 14.56 ppb. (or 0.01456 mg/L)  
2007: 12.41 ppb. (or 0.01241 mg/L)

She is surprised that the most recent reading from 2016 is so low, and that there seems to be a downward trend, given that they have no corrosion control treatment system in place. For the years before 2007 there are paper files that are disorganized, with tests from some of the years missing. The random differences in the data seem odd to Jessie –especially since there is no corrosion control system in place; she doesn’t know what would account for the discrepancies

in these lead levels, and she wouldn't expect to see testing as low as 1.21 ppb in an area where there is no corrosion control. She asks John about the testing, and he tells her all of the tests are within compliance now "because their supervisor has adopted a more reliable monitoring plan."

Jessie calls the supervisor at the Public Water Utility, a non-engineer who has been in his position for over 20 years. When he learns she is from the DNR and is asking about his recent test results, the conversation becomes tense, and he tells her that he is very proud of the work that his utility is doing for the Town of Murray; he understands the needs and priorities of their community, and he and his staff are doing everything they can to ensure the water is safe to drink but also affordable. Most importantly, he says, they need to maintain the public trust. Jessie tries to ask a question about his monitoring plan, but he cuts her off with, "John knows all of this – have you talked with John yet about our situation? He understood for years the pressures we are under here, and he was willing to work with us and approach this problem creatively."

An hour after this phone call, Jessie gets a phone call from a PE who does consulting work for the public water utility for the Town of Murray, and he tells her that her questions to the supervisor about the test data are completely absurd. Their monitoring plan, he claims, relies historically on "primarily Tier 1 sites, with just a few Tier 2 or Tier 3 sites mixed in -- not as many as a lot of other communities," and that the biggest problem is poor sampling methods used by the residential homeowners. "We give them a pamphlet with specific instructions to follow, but some of them just don't follow our instructions before they take a sample," he complained. "We even had to substitute a few new sites within our monitoring plan in the last triennium, because of these uncooperative homeowners." He also claims that overall the water in the community is safe, and that their test results are much better than a few other communities he's worked with in the past. He explains to her that once she understands her role a little better, she'll be able to see that the Town of Murray is not one of the most serious concerns in the state for water quality. He says, "With some experience, I hope you'll gain perspective on this issue."

Jessie goes to John to report these conversations, and John seems distracted and irritated – he's on his way out of the office for a vacation, and he simply tells her to let it go, don't document her concerns about it anywhere, and just take a "wait and see" attitude about this community.

1. Which parts of this case would raise a red flag for you in terms of ethics in your role and responsibility as a DNR water quality engineer? If you see multiple red flags, please list them:
  
  
  
  
  
  
  
  
  
  
2. If you don't see ANY red flags -- is there a part of the case that you could change *slightly* that would make the issue to your mind a BIGGER ethical concern?

3. Conversely, what part of the case would you change that might make this whole situation LESS of an ethical concern?

4. What options do you think Jessie has at this point, and what are the possible consequences (short and long-term) that you can imagine if she takes those options?

## **Part II**

The next part of the case takes place down the road now about three months, and it is spring 2019: Jessie has taken John's "wait and see" advice, and surprisingly, the test results that have been sent for 2019 show 1.21 ppb for the 90<sup>th</sup> percentile, which she feels is odd – she looks back at the test for 2016, and it is exactly the same data. She doesn't think it is likely that the tests would be that similar, and that raises questions about their testing. At the same time – the test is so low some might wonder why she is concerned. She thinks she ought to show John these results, but she is now uncomfortable talking with him about the situation. He seems unwilling to listen to more problems with Murray.

Which of the following options would be the most ethical choice for her at this point, and what are the challenges and possible consequences associated with each one?

1. Call up the supervisor of the city of Murray public water utility and ask him if he has seen these results; explain that such similar results are not really possible, and maybe we need to look more closely at the tests that have been conducted.

2. Call up the PE who does consulting work for the City of Murray public water utility, and ask him – is it possible that he accidentally sent the wrong data? This file is dated 2019, but the test data is exactly what was submitted in 2016.

3. Bite the bullet and tell John about the test; ask what he thinks the next steps should be.

4. Go to John's boss, the regional manager at the DNR – that person is not a water quality expert, but he does supervise the whole unit. Ask him whether these data suggest that there is a problem.
  
5. Formally document the anomalous results, but other than that, proceed with a wait and see approach.
  
6. Continue to do nothing, document nothing, and just take a wait and see approach.