

THORNTON COMMUNITY WATER SURVEY

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INTRODUCTION

Thornton is an unincorporated community of about 1,000 residents in northeastern San Joaquin County. It consists mostly of single family homes and also includes a large public housing development – made up of duplexes - that is run by the county and populated mostly by farmworkers and their families. The community’s water system is managed by the San Joaquin County Utilities Maintenance District, a division of the Public Works Department. The community has no local water board; the San Joaquin County Board of Supervisors has the responsibility to oversee their water system.

In 2009, the last year for which drinking water test results are available from the County¹, the concentration of manganese averaged 75 parts per billion in the water from the two wells serving Thornton, well above the drinking water standard of 50 parts per billion. Manganese is a secondary contaminant, meaning that it is regulated primarily for taste and odor impacts. Water with high manganese levels is brown in color and has a very unpleasant taste. The brown water is a nuisance that renders it virtually unusable; in addition to taste and odor concerns, it stains clothes, sinks, and tubs. While manganese at low levels provides an important dietary supplement, excessive amounts can cause iron deficiency and neurological problems. The U.S. Environmental Protection Agency has a recommended but not required a health-based standard of 300 parts per billion.

In 2005, the California Department of Public Health (DPH) granted a five-year waiver of the drinking water standard for manganese in Thornton, allowing the continued delivery of water to the residents of Thornton that exceeds the manganese standard. This decision was based on the County’s assessment that treating the problem would triple water rates. The waiver does come with requirements; specifically that the water be treated with a sequestering agent that is intended to reduce the discoloration effect (but not the concentration) of manganese, and that the system be flushed on a regular basis (at least quarterly) to remove manganese buildup in the pipes. The waiver is currently up for renewal. One factor in whether or not it is extended could be the County’s recent investment in a storage reservoir to meet the community’s emergency fire needs. The 2005 study included a storage reservoir as part of its cost assessment, so the new reservoir should reduce the costs of installing manganese treatment.

Clean Water Action (CWA) began a rural drinking water protection program in 2004 in response to the growing number of communities facing contamination of their drinking water supplies. In 2008, CWA engaged an organizer to directly assist communities with contaminated drinking water in the northern San Joaquin Valley. CWA began working in Thornton in the spring of 2010 at the request of the now-retired engineer for the California Department of Public Health (CDPH). CWA’s practice upon entering a community is to conduct a short survey of households to determine the community’s perception of its water quality and identify key concerns and community leaders. In this case, community members who complained about their water quality were also asked to sign complaint forms. More than 100 of these forms were submitted to the

¹ Data comes from the Consumer Confidence Report for Thornton, issued in July 2010 for testing completed in 2009

County. This was done to ensure that a full review of the waiver was conducted; if no complaints are received, CDPH has the option of automatically renewing the waiver.

Because the decision to renew or end the waiver is based on economics, CWA decided to conduct a more extensive survey of the community's current water costs to provide the community and the County with information that could be used as a basis of comparison with the County's treatment cost estimates.

[Addendum: as this report was being completed, San Joaquin County mailed a notice to Thornton ratepayers asking for their vote on whether they wanted to spend \$507/year plus an average of \$27/month for manganese treatment. A public meeting was held on May 24, which few, if any community members attended, and ratepayers were asked to respond by June 1. As of June 1, the County seemed certain that they had the votes to renew the waiver, this time for nine years.]

Waiver Renewal

California's drinking water regulations have very specific requirements governing the issuance or renewal of a waiver². The renewal requires that 50 percent or more of the billed customers of the water system approve the continuation of the current program of sequestration and flushing. Households that do not receive a water bill do not have a vote in the process.

Proposition 218

If a majority of the billed customers fail to return ballots (which is counted a vote for treatment) or vote proactively to have the water treated, the County would still be required to conduct a public process to raise rates as laid out in Proposition 218³. This 1996 constitutional amendment sets requirements for increasing parcel taxes. Because water rates are assessed on property, they have been determined to be subject to the initiative. Consequently, any rate increase requires a public process prior to adoption, and allows rate increases to be rejected by a majority vote of rate payers.

About the Survey

In an effort to determine community costs, CWA conducted a survey of Thornton community members about the costs they encounter due to their poor water quality. CWA adapted a bilingual survey instrument that was created for a community water survey in Tulare County. The survey (see Appendix A) required 15-30 minutes per household to conduct.

² California Code of Regulation, 2011, Health and Safety Code, Title 22, Division 4, Chapter 15, Article 16, Section 64449.2

³ California Constitution, Articles XIII C, XIII D

Twenty-five households were surveyed in the course of four visits in December 2010 and January 2011, representing 8.3% of the households in the community.

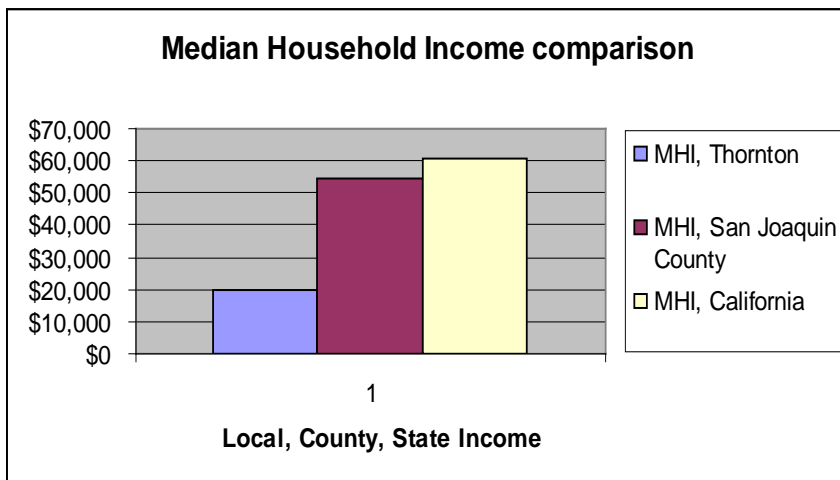
RESULTS

Because of the diversity of the community, the survey was conducted in both Spanish and English. Other languages spoken in Thornton include Portugese and Tagalog; however, we did not conduct surveys in these languages. Many Hispanic households were interviewed in English, but 6 of the 25, or 24 percent, of the surveys were conducted in Spanish.

The average residency in the community was 16 years, with a large split between homeowners (18 years) and renters (6 years). Fifteen households, or 60 percent of those interviewed, were renters. Nine of these, or 60 percent of the renters, paid their own water bill. However, 36 percent of the people surveyed do not pay their water bill directly. This is significant because both the process for extending the waiver and the Proposition 218 process for increasing rates grants decision-making power exclusively to those paying a water bill.

How much does the community spend for water?

Fourteen of the 25 households provided income information. The median household income (MHI) of these respondents was \$20,000 per year. The lowest annual income was \$3600 and the highest \$70,000.



The chart to the left provides a comparison of Thornton's MHI with that of San Joaquin County and the State of California⁴.

California defines a low-income community as one whose MHI is 80% or less of the State's. Thornton's MHI of \$20,000 is just 32 percent of the state MHI of \$61,017. (Note: a statistically valid rate survey, such as that needed

to qualify for funding as a disadvantaged community, would require an income survey of at least fifty percent of households in the community).

⁴ U.S. Census Bureau State and County Quick Facts, 2008

Only fifteen of the twenty-five households (60%) pay their own water bill, with the cost of water included in the rent of nine of the remaining 10 respondents. Since the survey was conducted in December and January, everyone who paid a water bill paid the winter flat rate of \$15. With summer usage data unavailable, this survey can only identify the lowest possible water costs.

Community members were asked to provide quantitative information about water purchases made outside the home. Most purchased both bottled and vended water, typically driving six to eight miles into Galt or Lodi to make the purchases. Only one respondent patronized the vended water machine at the local market. Though transportation costs were not used to calculate community water expenditures, it should be noted that one household admitted that they do drink their tap water at the end of the month because they cannot afford the gas to drive to the store.

The table below identifies average community expenditures on both outside water supplies and total water supplies (including winter water bill).

HOUSEHOLD EXPENDITURES ON WATER	Alternative water purchases	Alternative water purchases + water bill	US EPA recommended cost of water (as a percentage of income)
Percentage of income spent on water (14 responses)	1.93%	2.59%	1.5%
Average monthly cost of water (23 responses)	\$26.63	\$34.64	\$25

When the additional cost of purchasing alternative, potable water is added to the monthly water bills, even during the less expensive winter months, Thornton residents spend an average of 2.59% of their household income on water, 60 percent more than the US EPA recommendation for the percentage of household income that should be spent on drinking water.

Perceptions and actions around drinking water

Community members were also asked to provide qualitative information about the taste, smell, color and safety of their tap water. Respondents were given a choice of four responses: very concerned, somewhat concerned, not really concerned, and not at all concerned. Combining the first two responses yielded the following data, indicating that clearly the quality of their tap water is a significant issue for Thornton residents.

- Nineteen of 25 respondents, or 76%, were very or somewhat concerned with the *taste* of their tap water.
- Fifteen of 25 respondents, or 60%, were very or somewhat concerned with the *smell* of their tap water.
- Twenty-two of 25 respondents, or 88%, were very or somewhat concerned with the *color* of their tap water
- Eighteen of 25 respondents, or 72%, were very or somewhat concerned with the *safety* of their tap water

Community members were next asked what actions they have taken in response to concerns about the quality of their tap water. The top five actions are listed in the table to the right. Two of the responses, *Letting the tap water run* and *boiling water*, are discussed in more detail below.

Action to improve water quality	% of respondents taking action
Letting the tap water run	76%
Buying bottled water	60%
Taking shorter showers	52%
Boiling water	48%
Installed own filter	20%

Letting the tap water run

Manganese has a tendency to build up in water mains. As part of its waiver requirements, the county flushes the mains regularly – without notifying the residents. Many residents noted an occasional spike in discoloration that can likely be attributed to the flushing events. In addition, manganese can build up overnight in the distribution system, increasing the concentration of manganese when the water is first used in the morning. Most residents interviewed allow the tap water to run for several minutes when first used in order to reduce the discoloration of the water, and action that also reduces their exposure to higher, potentially harmful, levels of manganese. However, this ad hoc flushing regime also adds both to the individual household cost of water in the summer, when rates are based on volume, and to the water system’s cost of pumping and treating water.

The county should be able to develop an estimate of the cost of system and in-home flushing activities due to high manganese. For instance, the County should have information on the volume and cost of water wasted through the regularly mandated flushing of the water mains. On an individual household basis, a conservative back-of-the-envelope calculation could be made. If three-quarters of the 290 households in Thornton (using the percentage in our survey) allowed just their kitchen tap to run (at 1.5 gallons per minute) for five minutes each day, this would result in a waste of pumping and treatment of approximately 1600 gallons per day or 584,000 gallons per year. This is a very conservative figure, as it doesn’t take into account longer flushing times or multiple taps, and also assumes that the flushing will occur only once a day.

Boiling water

Nearly half of those interviewed boil their water. Boiling water is recommended for eliminating bacterial contamination, but that is not a problem in Thornton. Thornton currently contains of two metals in its drinking water; manganese, which has already been discussed, and arsenic, which has been detected at levels below the drinking water standard. Metals do not evaporate. Instead, boiling tap water *concentrates* these chemicals, and is *not* a recommended water treatment.

The responses to CWA’s survey illustrate the community’s proactive response to their tap water contamination. The County should play a more active role in partnering with the community to address their drinking water problems, at a minimum by providing better information about what actions are or are not appropriate to address Thornton’s water quality.

Other Costs incurred as a result of Thornton’s water quality

While the cost of purchasing of outside water was the only expense quantified, community members were also asked to identify other expenses incurred in trying to deal with the community’s tap water problems. The most popular responses are in the chart to the right.

Community members seemed most frustrated by the difficulty in getting and keeping their clothes clean, with several complaining about ruined clothing. Some also complained about the need to use harsh cleaning agents to clean stained porcelain sinks and toilets.

The information that 52% of the residents purchase juice, sodas and other beverages instead of water is deeply concerning, as it does indicate an indirect health effect. The U.S. Surgeon General has identified the consumption of sweetened beverages as a significant contributor to childhood obesity⁵, and recommends increasing consumption of water in schools and at home.

CWA also asked if residents felt that their tainted tap water has reduced their property values. 48% said yes, while 40% were unsure. Given that 60% of the respondents were renters, this is a significant number.

Finally, survey participants were asked if they felt that tap water quality has worsened in the past five years. 48% said yes, 32% were unsure, and 20% said no.

Expenses resulting from of tap water quality problems	% of Respondents impacted
Washing clothes a second time	76%
Stained toilet	68%
Purchasing juice, soda, and other beverages despite a preference for water	52%
Taking clothes to a laundromat instead of laundering them at home	52%
Purchasing skin crèmes or lotions because of harsh effects from washing with tainted water	40%

Recommendations

The survey clearly shows that Thornton’s water quality has an economic impact on its residents, an impact that is exacerbated by the very low incomes of many community members. In addition to a large number of farmworkers, many residents are seniors on fixed incomes. The current cost of finding alternative drinking water sources puts a strain on many budgets. The increased cost of treating tap water will need to be evaluated for those same impacts. While many do not pay their water bill directly, one could reasonably assume that any substantial increase in the water bill would be passed on to tenants in the form of a rent increase.

⁵ "The Surgeon General's Vision for a Healthy and Fit Nation, 2010". US Department of Health and Human Services. <http://www.surgeongeneral.gov/library/obesityvision/obesityvision2010.pdf>

This is a very difficult situation for both the community and the County, but there are actions that can be taken to benefit both.

1. Provide a lifeline water rate. One suggestion to mitigate the cost of drinking water for very low-income households is to design a year-round volumetric rate structure that ensures an affordable rate for a minimum quantity of water that is sufficient for basic human needs. The rate would then increase as the volume used increases. That could allow fixed or low-income households to conserve water to maintain affordable water rates. State legislation has been passed that specifically allows such conservation rate structures⁶. The County could also consider providing water conservation devices (such as faucet aerators and high-efficiency toilets) to assist low-income residents in reducing their water use.

2. Increase communication between the community and the County. CWA also recommends that the County play a larger role in working with the community to identify and address their water needs. For example, the County should inform residents of the flushing schedule for the mains, allowing them to avoid activities like doing laundry on days when they know that flushing will occur. The County should also provide better information on what residents should do (run water) and should not do (boil water) to address their water quality concerns.

The County does have a challenge in communicating with the community. In addition to the large number of Spanish speaking households, the number of renters that do not receive a water bill means that communication through the bill will miss a large number of residents. However, this is a small community and the County should be able to work with local community leaders that have expressed interest in improving communications. For example, Thornton does not have door-to-door mail delivery; residents must come to the Thornton post office to pick up their mail. Bi-lingual notices prominently posted would have a high likelihood of reaching most residents.

In particular, the County should expand its outreach process beyond the requirements of Proposition 218. Because Proposition 218 requires notification of *ratepayers*, many renters, including the residents of the public housing project, are not part of the legally required notification process. However, their health and economic well-being are inextricably linked to this process and all residents should be empowered to participate.

3. Find out more about the residents. CWA conducted only a sampling of the community. By interviewing a greater number (50% or more) of the households in the community, the County could verify the income level that we found. A more detailed survey could also begin to itemize other costs associated with drinking water, for instance by asking a number of households to maintain a daily journal of their water practices. In addition, more detailed information about individual water usage is needed to develop a low-income water rate

⁶ Assembly Bill 2882 (Senator Wolk), enrolled 2008, added Chapter 3.4 to Division 1 of the California Water code

APPENDIX A SURVEY

Clean Water Action
Thornton Household Survey Cover Sheet

Address: _____

Date of interview: _____

Start time of interview: _____

End time of interview: _____

Surveyor: _____

Date / Time to Return: _____

Participants First Name: _____

Language in which interview is being conducting (circle one): Spanish/English

What type of home does the interviewee live in?

- a. _____ Single-unit dwelling (house)
- b. _____ Multiple unit dwelling
- c. _____ Apartment
- d. _____ Trailer
- e. _____ Other

Household Survey Questionnaire

Introduction. We're surveying homes in Thornton to find out how much additional cost this community bears because of manganese contamination. As part of this

interview, we will ask to see your water bill. Would you mind finding your most recent water bill so we can review it during the interview?

Background

I will start off by asking you a few background questions

1. How many people live in your home? _____
 - a. How many adult?' _____
 - b. How many children (under 18) _____

2. How long have you and your family lived in this community/neighborhood/town?
_____ years **OR** Since _____ (date)

3. Does the head of this household rent or own this home?
 - a. _____ Rent
 - b. _____ Own
 - c. _____ Neither rent nor own

Perception of Contamination

I will now ask you a few questions about your household's tap water. When I say "tap water" I am referring to the water that comes out of your faucet or hose.

4. Is the taste of your tap water in your home a problem?
___ Yes, very ___ Yes, somewhat ___ No, not really ___ No, not at all

5. Is the smell of your tap water in your home a problem?
___ Yes, very ___ Yes, somewhat ___ No, not really ___ No, not at all

6. Is the color of your tap water in your home a problem?
___ Yes, very ___ Yes, somewhat ___ No, not really ___ No, not at all

7. Is the safety of your tap water in your home a problem?
___ Yes, very ___ Yes, somewhat ___ No, not really ___ No, not at all ___ I don't know

8. Do you know or believe your household tap water is contaminated?
 - a. Yes
 - b. No
 - c. Maybe/Not sure

9. I am going to read a list of things people sometimes do when they are concerned about the safety of their tap water. Please tell me if someone in your household has ever done any of these things because of concern about the tap water. *[Read through the list and check all that apply]*

- a. bought bottled water?
- b. install own filter?
- c. added vinegar to the water
- d. boiled the water
- e. added lye, soap, bleach (Clorox), or chlorine to the water
- f. prayed over the water
- g. let the tap water run for a moment after turning it on
- h. take shorter showers
- i. get water from a friend or neighbor's filter
- j. other _____

Tap water volume & costs

We would now like to ask you about your household water use and how much it costs you.

- 10. Do you pay for water separately from your rent?
 - a. Yes
 - b. No [*If no, skip to question #16*]

- 11. Does a member of your household receive a water bill for this house/apt/trailer?
 - c. Yes
 - d. No [*If no, skip to question #16*]

- 12. Can we look at your water bill and ask a few questions about it?
 - e. Yes [*If yes*] What is the billing period for this bill? _____ to _____
 - f. No [*If no, skip to question #15*]

- 13. How much water did your household use during the bill period shown? _____ (exact amount with gallons or units (specify))

- 14. What was the total water bill from this billing period? \$ _____

- 15. [*If participant did not present a water bill*] Can you estimate the house/apt/trailer's total water bill for the last month?
 - \$ _____ (exact amount) **OR**
 - a. Less than \$30/month
 - b. \$30 - \$40/month
 - c. \$40 - \$50/month
 - d. More than \$50/month

How do you know? [*Don't need to ask if participant presented a water bill*]

Filter use

Some households install filters on faucets or a filtration unit for the whole home. I will now be asking you a few questions about the use of filters in your home.

16. Do you or anyone in your household use a water filter in your home?
a. Yes
b. No [if no, skip to question #22]
17. How much did the filter cost?
\$ _____
18. Were there any additional upfront installation costs?
g. Yes [If yes] How much were the additional costs? \$ _____
h. No
19. How often do you buy a new filter?
_____ times per year
20. Are there any additional parts or supplies that you have to replace or add regularly?
i. Yes
j. No [If no, skip to question #22]
21. How often do you buy new filter parts or supplies?
_____ times per year
How much does your household spend on these parts and supplies each time you buy them?
\$ _____
22. Have you or someone else in your household ever bought any other equipment, product, or service intended to clean the water?
a Yes
b No [if no, skip to question #24]
23. What was the equipment, product, or service that you purchased?

How much did it cost? \$ _____

Non-tap water purchases

I will now be asking you questions about the different types of non-tap water you buy and how much you spend. Non-tap water refers to any water that you acquire from outside the home. This part of the survey may be tedious, but please bear with me as it is one of the most important components of the survey. Thanks.

24. Please tell me which of the following types of non-tap water your household buys. *[Read list and check all that apply]*

- a. Water delivery service
 - how much do you spend each month? \$
- b. Vended water that comes out of a machine not in a bottle
 - how much do you spend each month?
 - how far do you travel each month to buy vended water?
- c. Bottled water
 - how much do you spend each month?
 - how far do you travel each month to buy bottled water?
- d. Other, please specify:
 - how much do you spend each month?
 - how far do you travel each month to make this purchase?

I am going to ask you a few questions about things that are sometimes related to water contamination.

In the past year, has someone in your household....?	Yes	No	Not Sure
25... bought drinks like juice, soda, or others when you would have preferred to drink tap water?	Yes	No	Not Sure
26... bought kool-aid or other drink mixes to add to the water to cover up the taste of water?	Yes	No	Not Sure
27... had damage to their car from the tap water used to wash it?	Yes	No	Not Sure
28... had to get the plumbing fixed because of the water quality?	Yes	No	Not Sure
29... had to buy skin crèmes or lotions because of dry or irritated skin due after bathing?	Yes	No	Not Sure
30... washed clothes a second time due to stains from the water	Yes	No	Not Sure
31... gone to the Laundromat to wash clothes because the water in your house stains the clothes and the water in the Laundromat does not?	Yes	No	Not Sure
32... had to buy special detergent to prevent the water during clothes washing from staining your clothes?	Yes	No	Not Sure
33... had a toilet stained because of the water quality?	Yes	No	Not Sure
34. ..Had some other problem related to water quality? _____	Yes	No	Not Sure

Lastly, I'd like to ask you a few questions about your opinions regarding water quality. Please say whether you agree, disagree, or don't know about the following statements about your tap water.

	Agree	Disagree	Do not know
35. Drinking water problems have reduced the value of my property			
36. My household's drinking water quality has become worse in the past 5 years			

37. *[If person previously answered Yes the household has contamination issues]* Is there any way in which contaminated tap water impacts your household that we have not mentioned?

38. We would like to know about your household income in order to quantify the impact of the cost of water on your household. Again, this information is completely confidential and voluntary.

How much money does your household earn per month or per year?

- a. \$ _____ per month **OR** \$ _____ per year
- b. Decline to state
- c. Doesn't Know / not sure

[If respondent is not sure of the total household income, ask the following] What is the income of each adult in the house?

- \$ _____ per month **OR** \$ _____ per year
- \$ _____ per month **OR** \$ _____ per year
- \$ _____ per month **OR** \$ _____ per year
- \$ _____ per month **OR** \$ _____ per year

Is income pretty variable from month to month? How so?

Closing statement

- That was the last question, thank you so much for participating in this survey. The information that you shared will help to document how water quality issues and contamination affect people in this area.
- We are going to hold a community event to present the findings of the survey. No information will be mentioned in a way that could be connected to you or any other specific person. Would you like us to mail you an invitation to this event? [MARK ANSWER ON SURVEY COVER PAGE]
- Do you have any questions for me?
- Thanks again for your time.