

## Review#1:

Review of "Accessing safe drinking water: a citizen perspective on the role of science in a contentious issue," manuscript #01-55 submitted to Science, Technology, & Human Values.

This paper contains much fascinating material and pursues a range of themes around the topic of safe drinking for a small community in British Columbia. There is a good account of the struggle over extending the mains water supply to the community, including the uses of scientific rhetoric, couched within frameworks of citizen participation and distributive justice. Several theoretical literatures are introduced, including reflexive hermeneutic phenomenology.

The principal way that the paper can be improved is by providing greater focus, specifically by reducing or eliminating some of the themes so that key aims and conclusions can be highlighted. This will provide a much greater sense of direction and purpose. The current version contains five principal themes, by my count.

1. Access to safe water
2. Citizen participation and decision-making
3. Expert versus citizen rhetoric
4. Distributive justice
5. "Reflexivity": authors' perspectives, commitments and methods

The paper would be far more effective if one theme was adopted as central, with one or two other themes playing supporting roles. I will comment on each theme in turn.

### 1. Access to safe water

If this is the central theme, then additional literature dealing with the issue should be discussed and comparisons made. I am not an expert in this area, but I do know the work of my colleague Sharon Beder on sewage outfalls (<http://www.uow.edu.au/arts/sts/sbeder/>). As well, there are papers on the scare over the safety of Sydney water a few years ago (e.g. Lyn Carson and Stuart White, "Sydney Water Contamination Crisis", *Science and Public Policy*, 1998). However, I think access to safe water probably serves better as a case study illustrating one of the other themes.

2. Citizen participation and decision-making If this theme is adopted, then more of the literature in the field should be cited and discussed, for example Malcolm L. Goggin (ed.), *Governing Science and Technology in a Democracy* (Knoxville: University of Tennessee Press, 1986); Alan Irwin, *Citizen Science: A Study of People, Expertise, and Sustainable Development* (London: Routledge, 1995); Daniel Lee Kleinman (ed.), *Science, Technology, and Democracy* (Albany: State University of New York Press, 2000); Frank N. Laird, "Participatory analysis, democracy, and technological decision making," *Science, Technology, & Human Values*, Vol. 18, No. 3, Summer 1993, pp. 341-361; James C. Petersen (ed.), *Citizen Participation in Science Policy* (Amherst: University of Massachusetts Press, 1984); Richard E. Sclove, *Democracy and Technology* (New York: Guilford Press, 1995); Leslie Sklair, *Organized Knowledge: A Sociological View of Science and Technology* (St. Albans: Paladin, 1973); Langdon Winner (ed.), *Democracy in a Technological Society* (Dordrecht: Kluwer, 1992).

More important than just citations, though, is making a clear statement of what aspect of participation is being dealt with. The issues have been around a long time, so clarity of purpose is vital. Is the main point that participation is possible, that it is obstructed or not heeded, that public meetings do not constitute adequate participation, or what? Note that many of such points have been discussed at length previously.

### 3. Expert versus citizen rhetoric

A central place in the paper is given to the use of scientific rhetoric and credentials as trump cards in conflicts with citizens. If this is the key theme, then other work in the area should be cited (e.g. Mary Richardson, Joan Sherman and Michael Gismondi, *Willing Back the Words: Confronting Experts in an Environmental Public Hearing*, Toronto: Garamond, 1993; Michael Gismondi and Joan Sherman, "Pulp mills, fish contamination, and fish eaters: a participatory workshop on the politics of expert knowledge," *CNS*, Vol. 7, No. 4, December 1996, pp. 127-137; William D. Rifkin, "Negotiating expert status: who gets taken seriously," *IEEE Technology and Society Magazine*, Vol. 16, No. 1, Spring 1997, pp. 30-39) and the analysis developed considerably in the light of previous work.

Related to both themes 2 and 3 is the role of hearings as rhetorical and participative devices. The classic book *Rationality and Ritual* by Brian Wynne is relevant, as well as others cited in Richardson et al., 1993.

### 4. Distributive justice

While distributive justice, especially the environmental justice connection, is relevant, to make it a central theme would require saying what about the case study provides new or special insight into distributive justice and what special connection there is to science and technology.

5. "Reflexivity": authors' perspectives commitments and methods The authors reflect on their approach and their own commitments and involvement. This could be made a central theme by providing more information, especially on the divergences within the authorial team and the way these divergences affected perspectives and purposes. For one relevant perspective in the STS field and additional references, see Brian Martin, "Sticking a needle into science: the case of polio vaccines and the origin of AIDS," *Social Studies of Science*, Vol. 26, No. 2, May 1996, pp. 245-276.

\*\*\*\*

The authors are in the best position to decide which theme is most appropriate as the centrepiece of the paper. Whichever one is selected, the paper should be built as logically and systematically as possible, something that can be a special challenge with a team of authors. Theme 1 is not specifically an STS issue, unless some relevant theory is brought to bear. Of the theoretical themes, 2, 3 and 4 would each require greater depth or original emphases to offer new insights to ST&HV readers, while theme 5 seems to offer the greatest prospects for originality in the field but no doubt would require the most rewriting.

### Minor points

(I will give quotations rather than page numbers, since pagination in printouts can vary.)

\* Quite a number of items cited in the text are not listed in the bibliography, including AAAS 1989, Hankivsky 1999, Lave 1988, Maxwell 1992, McGinn and Roth 1999, Rodriguez 1997, Rorty 1989, Young 1990.

\* "Water is one of the most common substances of the world. It is so common that those of us who live in the Northern Hemisphere do not usually attend to it as something special." The first sentence refers to H<sub>2</sub>O as a chemical whereas the second refers implicitly to "safe water". Why not just start with "Safe water is so common for those who live in the affluent countries that most do not attend to it as something special."

\* The introduction of the case study is disjointed. Figure 1 is shown before telling what country or province is involved. It would be best to start by describing the water situation worldwide, then in Canada, and then to zoom in to the local region and its peculiarities. We should also be told how common the problem described is within Canada, especially in the region.

\* The sections "Data analysis" (which includes an account of phenomenological hermeneutics) and "Positioning of the authors" seem out of place, positioned as they are in the middle of the account of the case study.

\* In describing the Council meeting, the authors say "Council has responded to resident concerns in the form of 'scientific' data that there are no health concerns created by the poor quality of water, and that, 'you knew this stuff and you still moved there'." Until this point, the authors refer to the use of "technicist medical discourse" to dismiss the concerns of the residents, but in this sentence an explicitly nontechnical claim is used ('you knew this stuff and you still moved there'). It might be worth analysing this difference by using the concepts of constitutive and contingent repertoires as presented by Mulkey and Gilbert.

\* In analysing the discourse at the Council meeting, the authors should make clear exactly what point they are arguing. Is it that decisions are dominated or determined by scientific rationality ("technicist medical discourse")? Another perspective is that decisions are made on political (i.e., nontechnical) grounds, with scientific rationality simply used as the pretext.

\* It would be interesting to examine some alternative sociotechnical solutions to the conflict. For example, use of rainwater tanks, grey water systems, dry toilets and the like could mitigate problems with poor water quality, even if they do not eliminate them. (Tanks could supply clean water for at least part of the year.) Council could be asked to subsidise such developments as an alternative to the expense of constructing water mains. Have such options been canvassed, and if not, why not?

\* Yet another theme in the paper, besides the five I listed, is education. In describing student research relevant to the controversy, a link could be made to other community research (references are available through the Loka Institute).

Scott Armstrong (Wharton School, University of Pennsylvania) for many years has studied and reviewed research on peer review. In order to encourage innovation, he recommends that referees do not make a recommendation about acceptance or rejection, but only comment on papers and how they might be improved, leaving decisions to editors. (See for example J. S. Armstrong, "Peer review for journals: evidence on quality control, fairness, and innovation," *Science and Engineering Ethics*, Vol. 3, 1997, pp. 63-84.) I am persuaded by his arguments and hence make no formal recommendation about this paper.

As is my standard practice, I do not wish to be anonymous, and would be happy to correspond directly with the authors.

Brian Martin  
Science, Technology & Society  
University of Wollongong, NSW 2522, Australia fax: +61-2-4221 3452  
email: [brian\\_martin@uow.edu.au](mailto:brian_martin@uow.edu.au)  
<http://www.uow.edu.au/arts/sts/bmartin/>

Review#2:

Review of Manuscript: Accessing Safe Drinking Water: A Citizen Perspective on the Role of Science in a Contentious Issue

While this is an interesting paper focusing on an important issue, I cannot recommend publication in its present form.

Major Comments:

Overall, this was a very interesting paper in an area that has not been sufficiently explored. However, the paper, as it is currently structured does not sufficiently support its conclusions as listed in the abstract. The arguments need to be tightened to be more cohesive. Basic reorganization and restructuring required. One way in which some of this can be accomplished is by tying the paper more strongly to sociology of science literatures in terms of the construction of scientific claims (e.g. Gieryn, 1999, *Cultural Boundaries of Science*; Hilgartner, 2000, *Science on Stage*, etc.) in addition to drawing more from references already contained in the paper (e.g. Hannigan, Irwin, Irwin and Wynne, etc.)

The key issue the authors approach is to explore what level of scientific and technological literacy is needed to construct legitimate claims within a science-policy arena in order to affect decision-making processes. However, their argument is lacking. The key frames of this dispute lie in the 'development fear' vs. the 'fire safety and health concerns' of residents who want access to that water supply. These concerns are pivotal to the arguments raised by authors, and yet, they are not highlighted sooner. The implications these have for distributive justice and solidarity needs to be drawn more explicitly earlier in the paper.

The authors make certain statements that require concretization, that is, examples would be helpful to a reader. To illustrate, authors state on p.14 of their manuscript that the "independent

tests" of the water were "insufficient or flawed" - providing examples of how the Lowen Consulting Report was to address these previous inefficiencies would have been helpful in constructing their argument, particular in assessing the contested claims between Lowen's report and others. Similarly, the authors state that Lowen Consulting firm is accustomed to dealing with a great deal of controversy, and as such their often conflicting scientific findings with those of other tests have been used as the basis of litigation in other situations. It was insufficiently drawn out by the authors how this took place in this case study. P.21 talks about discrediting of the Capital Regional Health testing results, but doesn't really demonstrate it in their argument. In the following section the authors confuse the reader in that they argue that Lowen's methodology was flawed as the rest (which is how the sentence on p21 "thus the Water Advisory Task Force discredited in its report to Council information other than the one provided by the consultant (whose methodology has shown to have flaws during the meeting) - these flaws were never raised in the text before. Moreover, an issue the authors should address is whether or not testing can artificially show an increase or a decrease in a particular outcome or effect (e.g. timing of tests, seasonal variations, measures taken after rainfalls, etc.) Related to this, on P. 19, authors make the argument that no health effects could be found at the time of Lowen's measurements. Was there anything in the other independent reports to suggest otherwise?

Overall, more methodological detail is required. Transcripts and media stories were collected over what time frame, and what was the means for searching for these documents (computer database, etc.) These data were analyzed, but how? Were they coded? Were particular frameworks used in the analysis (e.g. construction of claims, framings, etc.)? Some examples of the "identified dimensions" of pages 10 and 11 would be helpful for a reader to understand how data were categorized. Moreover, ethical issues arise over the use of individual names. Did these people give consent? Do they know how these documents are being used? Have pseudonyms been used to protect individuals? Ordinary citizens making presentations at a public meeting still have rights to ensure their statements haven't been taken out of context or used without their knowledge.

On p.12 authors argue that local newspapers recurrently carry articles that feature citizens and local governments in contested situations over access to drinking water and removal of wastewater - what is the frequency of these articles compared to other water issues (e.g. contaminants in water supplies) or other environmental issues? The purpose of these broad measures would be helpful to provide a dimension of scale of the issue to readers, and to further contextualize the 'place' in which this is occurring.

More information is required about the Task Force - they are significant actors in influencing this debate and insufficient detail is given about their potential interests.

What was the breakdown of supporters vs. dissenters in the Majority vs. Minority reports? This would be interesting for readers. I think authors mention it much later in the paper, but it should be drawn out earlier.

Of interest, on p27 authors point to the environmental issues caused by the modifications made to a nearby creek for irrigation

purposes. Presumably (or not?) this was done in the interests of farmers? Are these not the same people now affected by the environmental degradation of their own water supply? Raises an interesting issue of who is ultimately responsible to pay for this. Moreover, what are the alternatives to extending the pipeline as mentioned on p.28?

Authors mention a series of negative health outcomes near the end of their paper ("the lives, health, reproductive choices and well being" of those residents living in the community) - but not all of these were demonstrated in the paper. While the authors point to some psychosocial impacts experienced by residents, the efforts to tie these to the literature, particularly in its reference to the WHO and more recent definitions of health adds little to the argument in its present form. These issues need to be raised much sooner in the paper.

Minor concerns:

Many stylistic errors, typos, and incomplete sentences are found throughout the paper. Some examples include:

P5, line 3, sentence "At least not until some serious..." is an incomplete sentence.

P5, lines 8-9, there appears to be a word or two missing "have since been filled with reports about the questionable quality of many other, especially native communities" ...many other what? And is there supposed to be a reference at the end of that sentence.

P5, line 3 after the block quote, the parentheses following the Chesnot reference should be "and becoming".

P7, last sentence of first paragraph: "on what grounds does AN individual..." not and.

P8, where is point D on the diagram. Frequent references to triangle ABD, but there is no D.

P10, watch your tense in line 4 of Data Analysis. "our ultimate goal IS" in order to be consistent with the overall verb tense of the paragraph.

P11, line 3 of Positioning of the authors section, should be citizens (plural, not singular).

P12, line 2 of Water in Central Saanich section, there shouldn't be two Ds in District.

P14, the acronym for Agricultural Land Reserve should be stated in parentheses, as it is referred to as ALR on p15 with no reference point.

P14 3rd paragraph, "areas" shouldn't be plural: "this consulting firm regularly works for various municipalities in the AREA"

P15 line 5, text should read "series" not "serious"

\*\* There are a series of these types of error in the rest of the paper. A careful editing is required after major restructuring is completed.