



Tracking & Evaluation: Water Smart Peer-to-Peer Operator Training

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Executive Summary

Water utility operator training and certification requirements have been identified as challenges facing rural communities in British Columbia generally, and within the Columbia Basin, with the existing training model presenting several issues. In order to address this challenge, the Peer-to-Peer approach to training was developed and a pilot project ran from April 2015 to December of 2015. A third party evaluation was designed to objectively track and evaluate the 2015 Peer-to-Peer (P2P) Operator Training Pilot Project delivered through a partnership between Columbia Basin Trust's Water Smart program and the Environmental Operators Certification Program. This research asked the following questions:

- 1) Is the Peer-to-Peer Operator Training approach effective?
- 2) What factors influenced the effectiveness of the approach?

A series of interviews and questionnaires throughout the pilot project were completed including managers, trainers, and trainees. Twenty-nine participants from six communities participated in this project. According to the EOCP training registry, in the Kootenay region in 2015 there were 5 providers registered, 8 instructors registered, 21 courses registered, 17 courses delivered, 48 operators reached, and 9.35 Continuing Education Units (CEUs) conveyed.

With regard to past CEU training the issues identified by participants were i) limited access to appropriate training within the region, ii) limited applicability of available training to local water systems, and iii) need for more hands-on learning opportunities. This could suggest that the solution is not to change the existing training system, but to add to it or complement it with an alternative such as P2P. This is echoed throughout participant responses, with the P2P approach seen as a complement to existing training offerings.

Many benefits related to the P2P approach were noted by participants, chief among them being the hands on training directly relevant to local systems. The majority of managers saw an immediate application of skills learned by staff and that a greater change was seen following P2P training than typical, classroom training. P2P was noted by most participants as providing different opportunities than classroom training, with both seen as having a purpose.

The comparison between the start and finish of the project illustrated several changes. Trainers, for example, became more confident – something noted by managers and trainees. There were differences among and between the three groups as well. For example, there were indications that age/experience were a factor relating to how CEUs and training are approached and what is needed, as well as how open people are to being taught by a peer. Managers and trainers were generally more knowledgeable about P2P and expressed more, and more in-depth, opinions. Many trainees responded in ways that suggested that better in-house communication is needed about the P2P pilot project.

Challenges with the P2P approach were also identified, such as the need for support, both internally (e.g., administrative and managerial) and externally (i.e., via a 3rd party

with organizational capacity¹). However, despite identified challenges overall the majority of participants felt that the P2P approach is effective and worth pursuing.

Many participants felt it would be beneficial to expand the pilot project to the regional level, including both in-house training and training between communities. Some felt that, for the smaller communities in particular who may not have enough staff to make in-house training viable, having a regional pool of training options would be beneficial. It was also noted that if there was similar levels of experience and expertise locally, that having a regional P2P would make more sense.

The analysis of the data collected for this evaluation indicates that the Peer-to-Peer approach to operator training is an effective, complementary method of training, warranting further exploration. The key element is that it is complementary, as benefits of existing training still stand. It was noted by several participants that efficiencies gained through P2P may serve to better support typical training. Overall the Peer-to-Peer pilot project can be considered a success in terms of introducing an effective, alternative training method.

The following recommendations were identified by this evaluation:

- 1) **Publication:** publication of the findings of this pilot project in appropriate popular literature venues is suggested as a means to share the results, as well as maintain and increase industry and government exposure to the concept of P2P training for water operators in the Basin and beyond².
- 2) **3rd party support:** participants noted this 3rd party support was important in terms of support for and organization of the pilot project, ensuring P2P remained a priority, providing the credibility required to gain political support, and providing a link between communities. Given the identified importance of third party support found by this evaluation, the identification of one or more organizations to act as this support/organizational body appears critical to the long term viability of a P2P training model in the Basin and elsewhere in BC. There are numerous organizations in BC that are directly engaged in water operator training that have the potential to act as 3rd party support. However, consideration will need to be given to relationship building between local communities and the 3rd party. Prior to the pilot project there was an existing working relationship between Columbia Basin Water Smart staff and the communities (see Appendix 2 for the details of the support provided by Water Smart).
- 3) **Dealing with challenges:** if a supporting organization decides to implement a P2P program, this organization may wish to address the P2P challenges identified by participants (e.g., the EOCP registration system, creation of resources, etc.).

¹ For the duration of the pilot project 3rd party support was provided by Water Smart, however Water Smart will not be providing support for future Peer to Peer water operator training.

² Columbia Basin Water Smart is preparing a popular literature article for publication in spring/summer 2016.

Consideration should be given to how to roll out the program to a regional scale to allow for collaboration between communities and the inclusion of small systems.

- 4) **Further study:** a second quantitative pilot project of larger scale and duration would be useful to see if the findings of this study hold true with a larger sample size, as well as to address those factors not covered here (e.g., quality of training, sustained behavioral change) or better address factors that were not adequately explored in this evaluation. Future study of the P2P approach could consider a broader sample size, as well as those additional elements noted in the Section 3.1 above (e.g., risk, accuracy, materials, and standards). Future investigation could also include what is appropriate to be taught through the P2P approach and what is not, in order to ensure P2P course content is appropriate.

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Publication Information

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1. Introduction

Drinking water systems provide a service critical for quality of life, the environment, and the economy (Breen & Markey, 2015). However, drinking water systems in rural regions face several challenges in the delivery of this service, such as financial limitations, infrastructure aging, changing regulation, and difficulty retaining certified water operators (Breen & Markey, 2015; Health Protection Branch, 2013; Office of the Provincial Health Officer, 2011).

Training of water utility operators has been identified as one challenge facing rural drinking water systems. Water and wastewater operators in British Columbia (BC) must, on an ongoing basis, complete training in the form of continuing education units (CEU) certified by the Environmental Operators Certification Program (EOCP) in order to remain in good standing³ (Environmental Operators Certification Program, 2014). Identified challenges with this training model include: classroom based training as opposed to hands on learning, travel requirements, cost, other logistical challenges, lack of direct applicability to local infrastructure, lack of opportunities in demand and water loss management, technology focused, and limited benefit for building in-house staff capacity (McGowan, 2015).

To explore the degree to which a Peer-to-Peer training (P2P) approach could help address this challenge Joe McGowan (City of Cranbrook), Jesse Reel (City of Castlegar), and Columbia Basin Trust's Water Smart program, in conjunction with EOCP, designed and executed a pilot project testing a P2P approach to training in the Canadian Columbia Basin (the Basin). The pilot project ran from April 2015 to December of 2015. This project was designed to **objectively track and evaluate Water Smart's Peer-to-Peer Operator Training Pilot Project**, focusing on the impact on the trainers, trainees, and management in each participating community. Given that the challenge of training is unlikely to be unique to the Basin, the results of this initial pilot project are likely to be of interest to operators, local and provincial governments, training organizations, and regulators. This research asked the following questions:

- 1) Is the Peer-to-Peer Operator Training approach effective?⁴
- 2) What factors influenced the effectiveness of the approach?

The objectives of this project are to:

- 1) Provide feedback to participating communities and to all Basin communities;
- 2) Provide feedback to pilot project partners; and
- 3) Evaluate the effectiveness of the peer-to-peer training model as a tool for augmenting water operator training and knowledge sharing.

2. Methods

2.1. Data Collection and Analysis

This evaluation applied a qualitative case study approach, including:

³ The number of CEUs required depends on the level of certification.

⁴ Within this project 'effective' is specific to training and certification of participating trainers and trainees. Other factors, such as program cost, are not considered.

- 1) **Trainer/Trainee interviews:** 10-15 minute semi-structured interviews. Trainers were interviewed twice, at the start (Round 1) and end (Round 2) of the pilot project, in order to gather and compare baseline data related to past training and expectations of the P2P pilot project against reflections on their P2P experience. Trainees were interviewed once at the end of the pilot project and were asked similar questions to Trainers. Questions were both open and closed ended.
- 2) **Manager questionnaire:** short, questionnaire style interview focusing on training needs, cost, effectiveness, and applicability of past training compared to the P2P approach. Managers were also questioned twice to allow for comparison. Questions were largely closed ended.
- 3) **Review of supplemental data:** additional information was collected to provide context for this report, including: available EOCP metrics, discussions with the Water Smart Team, researcher observations, and other unofficial conversations.

Questions were developed in conjunction with the Water Smart Team, taking feedback provided by Interior Heath Authority (IHA) and EOCP into consideration. Due to time constraints the final questions were selected from a larger list, prioritizing higher needs questions. Round 1 was completed in July/August 2015. Round 2 was completed in November/December 2015.

An initial contact list was provided by Water Smart, with additional contacts provided by managers or staff. Potential participants were contacted via phone and email, provided an overview of the evaluation, and asked if they would be willing to participate⁵. If yes, questions were provided, directly or indirectly, to respondents in advance⁶. The majority of the interviews and questionnaires took place over the phone. At the start of each interview or questionnaire participants were again informed of the purpose of the evaluation, that their participation is voluntary, and that their responses would be kept confidential. Verbal permission was given to record conversations and recordings were transcribed. Transcripts were analysed in two ways. NVivo qualitative analysis software was used to analyze the open ended responses. Closed ended responses were analysed using Excel. Twenty-nine participants from six communities participated in this project.

2.2. Scope and Limitations

This project examines and evaluates the effectiveness of the P2P training approach. While the P2P approach is compared with current CEU training, this evaluation does not consider other training models and this is not an evaluation of the EOCP itself. Also not included in this evaluation are i) the development of the P2P approach and the pilot project design, ii) P2P learning outcomes, and iii) the quality of the training provided.

This project is a targeted study, focused on a small sample size, and provides a qualitative evaluation of the pilot project. Statistical tests were not conducted because the sample size is not large enough to have valid statistical power. Additionally, while communities in the Basin had equal opportunity to participate and the communities involved were

⁵ One exception to this was the City of Cranbrook, where the manager served as the single point of contact, arranging meeting times with trainers and trainees.

⁶ There were six individuals where logistical constraints prevented questions from being sent in advance.

provided equal access to information, the six communities involved can be considered early adopters. As a result, this should be considered a non-representative sample. Other limitations include that as the majority of the interviews took place over the phone the researcher was unable to gather non-verbal responses. Questions could have been further simplified for clarification and to prevent repetition. The qualitative, conversational style meant that questions were not identically phrased each time. Open ended questions also allowed respondents to answer questions prior to being asked, leaving potential for repetition or inference of responses.

Finally, two trainers from Round 1 did not participate in Round 2 and three participants (2 trainers and 1 manager) from Round 2 did not participate in Round 1, influencing comparison between the two rounds. There was cross over between the different groups of participants (i.e., 2 managers were also trainers, 7 trainers were also trainees). Where participants had dual roles it was difficult to separate their perspectives. One trainee had not had a chance to receive P2P training.

3. Findings

3.1. Overview of Participants

From the 6 participating communities 29 individuals participated in interviews or questionnaires for this project: 16 in Round 1 and 25 in Round 2⁷. Participants included: 7 managers, 14 trainers, and 15 trainees⁸.

Participation in P2P

The majority of participants volunteered to participate in the P2P pilot project. All managers volunteered to participate in the P2P project. They noted a variety of reasons, such as the need for an alternative, the potential benefits (e.g., reduced cost), and that staff should get credit for what already goes on informally.

There were twelve trainers that were not also managers. Of those, 10/12 volunteered, although two indicated they were 'voluntold'. One indicated 'no', but that he likely would have volunteered. The most popular reason trainers gave for volunteering related to the need to have a structure in place to train new people and pass on knowledge. The second most popular reason was general interest in new opportunities and learning new skills.

There were eight trainees that were not also trainers. Trainees were split in terms of whether or not they volunteered. Two of those who indicated 'yes' to volunteering also indicated they were voluntold. As such, the majority of trainees appear to have been told they were participating as opposed to volunteering.

Participant Experience

'Managers' included directors, managers, and supervisors. One manager has a non-water/non-utility role (i.e., CAO/CFO). Participants from this group typically had decades

⁷ Two participants from Round 1 did not participate in Round 2 (2 trainers) and three new participants were added in Round 2 (2 trainers, 1 manager)

⁸ Two managers are also trainers and seven trainers are also trainees.

of experience in water, although not all of their experience was in their current role. Certifications are not applicable (NA) for managerial positions.

Trainer and trainee participants were generally operators or an equivalent, with three exceptions (i.e., managers, engineering technician). Trainers and trainees have similar levels of experience, including a range of years of relevant work experience, averaging between 11-12 years. In terms of water operations certification, the trainers were dominated by EOCP level 2 certifications, but ranged between levels 1-4. The majority of trainees were tied between EOCP levels 1 and 2, but ranged between levels 1-3.

Between the six communities, managers indicated there are ~57 staff requiring training, of which ~51 had some form of CEU training in 2015 prior to Round 1. Initially managers expected ~27 people to participate in P2P. When asked in Round 2 how many staff participated, ~26 staff were counted, however the exact number is higher as two managers did not have numbers for trainees. In terms of courses delivered, one community completed zero, two were not sure, and the combined total of the remaining three communities was 26, which includes double counts as some courses were offered multiple times. CEU equivalents were not provided. The number of courses trainees participated in was ~25, however this is not 25 separate courses as multiple trainees participated in several courses. The total courses taught indicated by trainers is ~16, also including double counts as some courses were taught more than once. Three trainers taught at least one course one on one. The majority of the training took place in a small group, mostly with 2 people, but with as many as 5.

As a result of discrepancies in the data collected, the EOCP training registry was used to gain a more accurate summary of the courses delivered. According to the training registry, for the Kootenay region in 2015 there were 5 providers registered, 8 instructors registered, 21 courses registered, 17 courses delivered, 48 operators reached, and 9.35 CEUs conveyed (<http://www.trainingregistry.eocp.ca/get/showP2PStatisticsTABS.php>, see Appendix 1). However, the training registry does not provide an explanation as to whether there are double counts among the courses delivered and operators reached, as well as how the number of CEUs are allotted to each course.

3.2. Response Summary

3.2.1. Past CEU Training

In Round 1 managers and trainers were asked about past CEU training. Trainees, and the two trainers that joined in Round 2, were asked the same questions in Round 2. Trainers and trainees were asked to consider the past 5 years of training they received. Managers were asked to consider the past year.

Manager Expectations

Managers were asked about their expectations of CEU training, which generally focused on staff learning new skills or knowledge, enhancing their performance, and maintaining their certifications. Several managers also noted that they expect training to be directly relevant to their local system. As shown in Table 1, managers are split as to whether past training meets expectations. Despite the split the qualifiers were similar. For example,

most managers felt that while past CEU training has merit there are gaps in terms of direct applicability within the local context. Other issues included cost, travel, and limited access – all of which were linked to concerns that staff sometimes attend EOCP certified training as a result of convenience (e.g., proximity, timing) in order to meet minimum CEU requirements, as opposed to attending training that is directly relevant or desirable for their local system, experience, needs, etc.

Manager Observations

Managers were also asked questions regarding the effectiveness and applicability of past CEU training (see Table 1). Qualifiers relating to these questions were similar. Past training was largely seen to have some benefit (e.g., building networks), but lacking local relevance. Some commented that if staff are experienced and are re-taking courses, why should they not be able to do refreshers on their own system? Managers were also asked if they had an in-house mentorship program prior to the P2P pilot project. One community did not, due to their small size. The other five communities indicated a combination of yes or somewhat – with each having some form of informal in-house training or mentorship.

Table 1 - Manager Responses to Past CEU Training Approach

Question (/6)	Yes	Somewhat	No
Have your expectations regarding CEU training been met?	2	2	2
Have you seen a noticeable change in staff skills/ability following CEU training?	2	-	4
Are your staff able to apply what they learned in past CEU training?	4	1	1

Cost

Managers were also asked for an annual cost estimate for CEU training. Figures ranged from \$7,000-\$50,000 per year. Two-thirds of managers did not feel this was cost effective, given the cost of time and travel, logistical challenges, and budget limitations.

Past Training Experiences - Trainers

Trainers were asked about their experiences with CEU training in the past five years – the delivery method, opportunities available, relevance, and applicability (see Table 2). All trainers said that over 50% of their past training experiences took place in an in-class setting. The majority saw some degree of merit in their past training experiences. For example, the benefits of the networking at training events was cited. However, the majority of affirmative responses were qualified with a negative. For example, most commonly trainers expressed a desire for hands on learning, whether in conjunction with the in-class to reinforce what is being taught, or simply more hands on training.

Several participants noted that some in-class courses are fine to provide foundational information or for more ubiquitous, non-system specific subjects (e.g., first aid, chlorine handling). Some, but not all, past training was seen as applicable or relevant for day to day jobs. Further critiques of past training approaches were noted when participants were asked to compare their P2P experience with past experiences (e.g., class size). There were also differences in opinion as to the availability of opportunities. Recognizing the

sample size is significant, it appears as though career stage may influence of training. For example, a few more experienced participants (>20 years experience) viewed the collection of CEUs negatively, as something unrelated to their job.

When asked if they had ever taken a course just to get the CEU credit, 6/14 said ‘yes,’ 5/14 said ‘no’, and 3/14 had no response (i.e., NA) or were unsure. When asked to expand on this, some of those that had not said that they could see why others would. Others noted that CEUs are needed to ‘level up’, but not for their daily job. Some saw this as a waste of money and something they tried to avoid. Finally, a few noted that sales based CEUs (e.g., hydrants) may be repetitious, but they are hands on and accessible.

Past Training Experiences - Trainees

Trainees were asked the same set of questions (see Table 2). The majority (6/8) said that over 50% of their past training experiences has taken place in an in class setting. Similarly to the trainers, trainees noted that there were relevant and useful elements of past training, but often the material covered was so broad as to include things beyond what is relevant locally. Also the need for hands on training was cited, either on its own or as a complement. Some noted that managers try to focus on finding relevant training opportunities for staff.

When asked if they had taken a course just to get the CEU credit, 3/8 said yes, 3/8 said no, and for 2/8 this was NA. Some felt, similarly to some trainers, that this is linked with the easily accessible, sales based courses. There was a similar experienced based observation as with the trainers, however this did not hold true in all cases.

Table 2 – Trainer and Trainee Responses to Past CEU Training Approach

Question	Yes	Sometimes / Somewhat	No	Not Applicable
Trainers (/14⁹)				
Did you find past CEU training to be an effective way of learning?	7	3	3	1
Have CEU courses offered allowed you to learn a new skill or improve an existing skill?	10	1	2	1
Have the CEUs you completed been relevant on the job?	11	1	1	1
Have you been able to apply what you learned in CEU training?	10	1	2	1
Trainees (/8¹⁰)				
Did you find past CEU training to be an effective way of learning?	2	3	2	1
Have CEU courses offered allowed you to learn a new skill or improve an existing skill?	7	-	-	1
Have the CEUs you completed been relevant on the job?	4	3	-	1
Have you been able to apply what you learned in CEU training?	4	3	-	1

⁹ The 14 includes the two trainers who are also managers as the questions are different.

¹⁰ Only includes those who were just trainees.

3.2.2. P2P Training

Manager Expectations

Managers were asked questions in Round 1 pertaining to their expectations of the P2P pilot project and whether it met their expectations in Round 2 (see Table 3). A range of expectations and potential benefits were noted, the most common being the provision of better training, including: more opportunities, tailored to meet local needs, hands on/in the field, and done in a way staff are better able to understand and apply training. Some expected this could potentially decrease the taking of courses for just to get the CEU. Reduction of cost and more efficient use of training budgets were also noted. Managers expected that P2P would be both effective and applicable as a result of factors such as the hands on nature and the direct application to day to day work.

In Round 2 managers were asked if the P2P project met their expectations. The majority (5/6) indicated it did, with three noting it had exceeded their initial expectations. The sixth manager indicated NA due to not having been able to put on any courses. Several noted additional outcomes, such as the creation of long term resources (e.g., standard operating procedures), increased skill and confidence in trainers as a result of the process of course building, flexibility in terms of when a course could be offered, and the ability to cater to specific people.

Manager Observations

When asked questions relating to the effectiveness and applicability of the P2P approach, most managers noted an immediate application of the skills learned. However, some (2) were unsure about application, as their training sessions had been held very recently, making it difficult to judge. Managers were asked comparison questions relating to change in staff skills/ability and ability to apply what was learned relative to past CEU training. The majority felt the P2P process resulted in a greater change and more applicable skills. It was noted that the P2P provided training that would not be available otherwise. To this end several managers noted that P2P provides different opportunities, in particular for refreshers or improvements to existing skills. However, some noted that in-class training still has a place. Some also noted that with P2P trainers and trainees were more engaged in the process.

Managers were asked in Rounds 1 and 2 about their confidence in the ability of staff to train other staff. In Round 1 all indicated they had confidence in their staff due to their experience, personalities, and the mutual respect that exists among the staff. However, some noted that teaching would be a new skill. One manager observed he had more confidence in the staff than the staff themselves. Similarly in Round 2 all the managers indicated they had confidence in staff, excepting one respondent who answered NA due to no classes having been held. However, the difference between the two rounds is in the qualifiers. In Round 2, managers spoke more confidently of their staff and the efforts that had been put into P2P training. One manager indicated while he had some initial concerns, staff had risen to the opportunity.

Table 3 - Manager Responses to P2P Training Approach

Question (R1 - /6, R2 - /7 ¹¹)	Yes / More	Somewhat / Maybe / Equal	No / Less	Other (NA ¹² or unsure)
Were your expectations of P2P met?	R2: 6	R2: -	R2: -	R2: 1
Have you seen a noticeable change in staff skills/ability following P2P training?	R2: 3	R2: 2	R2: -	R2: 2
Relative to past CEU training have you seen more/equal/less change in staff skill/ability?	R2: 3	R2:1	R2: -	R2: 3
Will staff be able to apply what they learn in P2P on the job?	R1: 6 R2: 6	-	-	R1: - R2: 1
Relative to past CEU training will staff be more/equal/less able to apply what they learn?	R2: 5	R2: 1	R2:-	R2: 1

Cost

Overall there was uncertainty surrounding the cost of P2P. No dollar estimates were provided for the cost of P2P pilot and one manager noted it was difficult to track the costs, excepting the cost of course registration. Most felt the cost would be reduced to the cost of staff time. Others mentioned that because the staff have to be there anyway that costs would be minimal. In Round 2 6/7 managers indicated that P2P training is cost effective, with the seventh indicating NA due to that community being unable to provide any courses during the pilot. Managers noted a decrease in travel costs with similar time spent.

Trainer Expectations

Trainers were asked questions pertaining to their expectations of the P2P pilot project in Round 1 and whether those expectations were met in Round 2. There was a range of responses relating to expectations. Most trainers cited i) the creation of a formal structure that allowed them to get credit for training and provided consistent training for new people, and ii) improvements to training, in particular training that is hands on and specialized to their system. Some noted the potential for collaboration and networking within the region. The majority felt their expectations were met.

Trainer Experiences

Table 4 shows the responses of trainers and trainees to questions about delivery method, opportunities, relevance, and application. While seven trainers were also trainees their responses to the questions blended together, making it difficult to separate. As a result responses for trainers and trainees are combined. Where responses were NA, it was as a result of trainers who didn't train, trainees who did not participate, uncertainty, where questions were not asked or were not answered.

Trainers were asked to rate their level of knowledge in their subject matter in Round 1 and Round 2. They were also asked about their confidence in themselves as a trainer. In Round 1 trainers rated their level of knowledge between 3 and 10, with 8-9 being the most

¹¹ Where R1 is not indicated the question was not asked in Round 1.

¹² Not applicable.

common. Lower ratings generally included a qualifier such as them being new to the subject. Several specifically underscored that they were rating their knowledge, not their teaching ability. When asked about their confidence in their teaching ability 11/12 trainers indicated 'yes' they were confident. However, there was some nervousness regarding presentation or public speaking. A few noted existing, transferable experience. In Round 2 the knowledge self-rating was higher, all between 7 and 9. Two trainers lowered their ratings from Round 1, indicating that through the process they had learned more about the topic and realized they had more to learn. In terms of confidence in training ability, 9/12 indicated 'yes' they were confident, with the remaining 3 being NA (e.g., unable to teach a course). The key change was in the qualifiers, with Round 2 including less nervousness and more comments like 'definitely' or 'for sure'. Several trainers indicated that they felt they got better with practice and enjoyed teaching.

Qualifying responses from trainers were dominated by discussions of the P2P approach being more practical, hands on, real life, and locally relevant than typical CEU training. Several noted that the focus of P2P was on improving, reinforcing, enhancing, and expanding existing skills, although a few highlighted they learned new skills as a result of developing and delivering a class. The majority of trainers viewed the P2P approach as providing an alternate training option. P2P provided different opportunities and allowed more depth and detail on a specific task, as opposed to the broad foundational knowledge, although some noted this is also needed. Several felt that P2P made a good complement to typical CEU training, as opposed to a replacement.

Trainee Expectations

As trainees were only asked questions in Round 2 their questions focused on their P2P experiences specific to delivery method, opportunities, applicability, and relevance. When asked if they had any expectations coming into the pilot project, the majority (6/8 – those who were trainees only) noted they did not have expectations. Some cited that they were uncertain or curious.

Trainee Experiences

All 15 trainees were asked if they had confidence in their trainers' abilities and 13/15 indicated 'yes' they did. Trainees most often citing their trainer's speciality in that topic or a general level of trust in their trainer's experience and knowledge. One trainee indicated they were somewhat confident, noting that some people make better trainers than others. The same participant wondered if that P2P might work better regionally, as similar experience locally might make teaching each other difficult.

When trainees were asked about delivery method, opportunities, relevance, and application (see Table 4) there were some similar responses and qualifiers to the trainers. For example, the majority of trainees enjoyed that P2P training was hands on and relevant to their system. Additionally, several noted that the small group, face to face setting was a benefit. Trainees felt the setting allowed for a tailored learning environment, allowed trainees to focus on a particular task, and allowed trainees to comfortably repeat tasks and ask questions. Some felt that afforded them more confidence in the skills they were developing. One noted that P2P is a great blend of a comfortable causal setting, with

formalized legitimacy. Most trainees said that skills learned were a refresher, with some indicating that it involved a part of their system they do not typically work with.

Table 4 – Trainer and Trainee Responses to P2P Training Approach (R2)

Question (/20) ¹³ * trainer only + trainee only	Yes / More	Somewhat / Maybe / Equal / Different	No / Less	Other (NA / None / Unsure)
Do you think the P2P training method provides an effective learning environment?	16	1	-	3
Relative to past training, do you think P2P is a more, equal, or less effective way of training?	10	5	-	5
Did P2P offer the opportunity to learn a new skill or improve an existing skill?	14	3	-	3
Relative to past CEU training did P2P offer more, equal, fewer, or different training opportunities?	1	12	-	7
Is the P2P training relevant on the job?	17	-	-	3
Relative to past CEU training is P2P more, equal, or less relevant?	9	2	-	9
Do you think you/your trainees will be able to apply what they learned in P2P on the job?	16	1	-	3
Relative to past training is P2P more, equal, or less applicable?	8	2	-	10
Would you continue to be a P2P trainer in the future?*(/12)	11	-	-	1
Would you take more P2P training in the future?+(15)	13	-	-	2
Would you consider becoming a P2P trainer?+(/8)	3	2	3	-

General – Future Participation

When asked about future P2P participation the majority of participants indicated a willingness to continue in some capacity – as a trainer, trainee, and sometimes both (see Table 4). Of the trainees who indicated they do not wish to be trainers, two were uncomfortable speaking in front of others and the third felt they did not have enough experience. Of those trainees who said they would become trainers, two were in the process of doing so and one noted they would only do so in-house.

General – Water Smart Support

Managers were asked if they would continue an in-house P2P program without the support of Water Smart (see Appendix 2 for the details of the support provided by Water Smart staff). In Round 1 the majority of managers indicated ‘no’ (4/6). When asked in Round 2 the responses changed, with 2/7 saying ‘no’, 3/7 saying ‘yes’, and 2/7 saying ‘maybe’. Overall three managers changed their opinion, one no to yes, one maybe to yes,

¹³ Total people 20 – common questions /20, trainer only /12, trainee only /15 (8+7)

and one no to maybe. However, qualifiers between the two rounds were similar with all managers noting that the support of Water Smart had been critical in launching and running the pilot project. The majority of managers pointed to the need for 3rd party support in terms of organization – someone with the time and resources to oversee the pilot project. Others noted the need for an external body to push the project forward and to make it a priority, otherwise it is overshadowed by day to day demands. These same people also felt Water Smart added an element of credibility required to gain local political support. Some noted that Water Smart serves as a link between the communities, allowing for collaboration and exchange of information.

Overall, interviewees identified external, 3rd party support as critical to the P2P training approach. In the case of the pilot project this 3rd party support was provided by the Columbia Basin Water Smart program and there was a pre-existing relationship between the communities and Water Smart staff. However, Water Smart will not be providing support for future Peer to Peer water operator training, necessitating the involvement of another 3rd party organization(s).

Those who felt they could or would continue without 3rd party support indicated that this would only be possible with an established framework. Of these people, some noted they would proceed on a smaller scale, potentially more informally (e.g., not getting CEU credits) and that it would be unlikely that smaller communities with fewer resources would be able to do so.

Trainers were asked in both rounds if they would participate/continue to participate in an in-house P2P approach in the absence of support from Water Smart. Because two of the trainers responded to this question as managers, this is /10, rather than /12. Initially 7/10 trainers indicated 'no'. In Round 2 there was no decisive leader, with 5 saying 'yes', 3 'no', 1 'maybe', and 1 'uncertain'. Six trainers changed their minds – 4 from no to yes, 1 from yes to no, and 1 from maybe to no. Trainers had similar qualifiers as managers, largely that a certain amount of external, 3rd party support is needed to drive the project, to make it a priority, and to lend credibility with managers and council. There were contrasting views among trainers. For example, one felt their utility would continue because of the push coming from management where another indicated they would like to continue, but that it would require support from elsewhere because while management was supportive, it was not a priority for them, necessitating external pressure. Some noted that something similar had been tried successfully in the past, while others indicated past attempts had failed. Those who wanted to continue also indicated it would not be as smooth and would require more effort that they may not have time for. Some trainers also felt that once the framework was in place it would be possible to continue. Trainees were not asked about Water Smart support.

General – Challenges and Suggestions

All participants were asked if they saw any challenges or had any concerns related to the P2P model. Managers were asked in both rounds. In Round 1 manager responses were split evenly between 'yes' and 'no'. In Round 2, two 'no's changed to 'yes', giving the majority to 'yes'. Initially the dominant concern was that of ongoing support, internally and

externally, particularly in terms of administration. The workload and time of those involved were also noted. One manager felt that the pilot project needed to be up and rolling before challenges could be identified, and another pointed out that a program will need to be fully functional before other systems or municipalities would join. The theme of need for support continued into Round 2 as well. Several managers also noted that there were challenges related to EOCP, such as the registration process, paperwork, and general issues around how EOCP gives out credits. One manager noted barriers to expanding the P2P regionally to small systems (e.g., legalities, small systems needing certain procedures in place).

Trainers were equally split in Round 1, but there were several changes between rounds – two ‘yes’ to ‘no’ and two ‘no’ to ‘yes/somewhat’. Overall ‘yes/somewhat’ was 6/10. Trainer concerns were more varied than managers. In both rounds trainers often noted the need for continued buy in and support from managers in terms of participation, prioritizing P2P, and using work time to prepare courses. Time generally was cited as a challenge, given the responsibilities of the operators. External, 3rd party support was also cited. One participant noted that without support from Water Smart that the pilot project would not have gotten going and that some initial challenges would not have been overcome. Trainers identified challenges with EOCP’s online registration system – in terms of registration as an instructor and the 3-year experience requirement. A few pointed out the potential for abuse of P2P exists, in terms of using it solely to get CEUs, or managers simply looking for a quick and cheap way for staff to get CEUs, as opposed to providing quality training that serves similar benefits. There were questions and concerns surrounding logistics and changes – such as if the approach moved from small (e.g., 1-to-1 or groups of 2 or 3) to larger groups (e.g., more similar to the typical classroom setting) and whether other communities would be able to piggy-back on the work and effort from the initial course creation. Several mentioned the challenge and potential redundancy of training those with more experience than the trainer.

Trainees were asked about challenges in Round 2 and had the least to say. Half of the eight that are trainees only indicated they saw no challenges or concerns, or said that their experience with the pilot project was too limited to comment. Of the other half there were a range of comments. One felt there may be issues where the trainee had more experience than the trainer. Another noted that much depends on the trainer, and that some people are not good at conveying information. Another also mentioned maintaining smaller groups would be best. Lastly, one suggested moving forward cautiously.

General suggestions for improvement dealt largely with needing to address the challenges noted above (e.g., improvements to EOCP’s online registration system, trainers getting CEUs each time they teach a course, further consideration of the 3-year experience requirement in emerging fields). By far the most cited suggestion was to change the approach from in-house to one that is regionally interactive, allowing for training and collaboration between municipalities and other unincorporated or private water systems – something mentioned by managers and trainers alike. One community indicated that they are also applying the P2P approach beyond water. Other suggestions included access to resources to help trainers (e.g., the binder from Cranbrook or a video

example). A few comments were made regarding communication of training opportunities beyond the EOCP registry. One example was given of using Selkirk College's course registry.

Overall

All participants were all asked in Round 2 if they thought the P2P approach is an effective method of training? There were 25 participants in Round 2 (excluding duplicates) and 22/25 said 'yes'. One trainer indicated NA because they had not had a chance to train anyone, one trainee said NA due to lack of participation, and one trainee said somewhat.

4. Discussion and Recommendations

The Peer-to-Peer Operator Training pilot project was a locally driven project designed to determine the degree to which a Peer-to-Peer training approach could help address challenges with water operator training and certification within the Columbia Basin Trust region. It was also hoped that the pilot would yield beneficial learning outcomes to the trainees and trainers involved. The purpose of this project was to objectively track and evaluate Water Smart's Peer-to-Peer Operator Training Pilot Project. Overall, while the responses from participants demonstrate a range of perspectives, there are commonalities.

With regard to past CEU training the issues broadly identified were i) access (e.g., cost, time, people), ii) applicability to local system, and iii) need for more hands on delivery. This could suggest the solution is not to change the existing training system, but to add to it or complement it with an alternative such as P2P. This is echoed at several points, particularly by trainers and trainees who viewed the P2P approach as a complement to existing training, something that allows practical, hands on, in-depth training around a relevant local task or procedure, but leaving room for the typical in-class training as well.

The comparison between different rounds illustrated several changes. Trainers, for example, became more confident – something noted by managers and trainers. More critiques of past training came out in Round 2 in comparison with P2P experiences. The size of the classes was raised, particularly by trainees. Small classes were seen as a more comfortable environment to ask questions and repeat tasks.

Recognizing that the sample size is not large enough for an in-depth comparison, differences were noted among and between the three groups. For example, there were indications that career stage (e.g., age, experience) is a factor in how CEUs and training are approached. For example, among some participant's career stage was one factor that accounted for differences in how CEUs are viewed, how training is perceived and approached, and how open people are to being taught by a peer – particularly a younger or less experienced peer. This is something that could warrant further exploration.

Similarly, differences between communities based on size were also present, but not enough data was available for an in depth comparison. Managers and trainers were generally more knowledgeable about P2P and expressed more, and more in-depth,

opinions. The responses of many trainees suggested that better in-house communication is needed about P2P (e.g., purpose and process).

Many benefits related to the P2P approach were noted, chief among them being the hands on training directly relevant to local water systems. Challenges with the P2P approach were also identified. Perhaps the most immediate challenge is the need for support, both internally (e.g., administrative and managerial) and externally and externally (i.e., via a 3rd party with organizational capacity). In particular, the need for an external, 3rd party to provide support, credibility, and to ensure that P2P training is not placed on the back burner in favour of day-to-day operations. However, despite identified challenges overall the majority of participants felt that the P2P approach is effective and worth pursuing.

The analysis of the data collected for this evaluation indicates that the Peer-to-Peer approach to operator training is an effective, complementary method of training, warranting further exploration. The key element is that it is complementary, as benefits of existing training (e.g., networking and foundational knowledge) still stand. It was noted by several participants that efficiencies gained through P2P (e.g., money saved) may serve to better support typical training (e.g., allowing enough money for staff to maintain CEUs locally, while sending staff away to external training as needed). Overall the Peer-to-Peer pilot project can be considered a success in terms of introducing an effective, alternative training method.

5. Recommendations

Heading forward following this report there are several possible next steps that could be explored by organizations with the mandate to support in water operator training in BC.

- 1) **Publication:** publication of the findings of this pilot project in appropriate popular literature venues is suggested as a means to share the results, as well as maintain and increase industry and government exposure to the concept of P2P training for water operators in the Basin and beyond¹⁴.
- 2) **3rd party support:** participants noted this 3rd party support was important in terms of support for and organization of the pilot project, ensuring P2P remained a priority, providing the credibility required to gain political support, and providing a link between communities. Given the identified importance of third party support found by this evaluation, the identification of one or more organizations to act as this support/organizational body appears critical to the long term viability of a P2P training model in the Basin and elsewhere in BC. There are numerous organizations in BC that are directly engaged in water operator training that have the potential to act as 3rd party support. However, consideration will need to be given to relationship building between local communities and the 3rd party. Prior to the pilot project there was an existing working relationship between Columbia

¹⁴ Columbia Basin Water Smart is preparing a popular literature article for publication in spring/summer 2016.

Basin Water Smart staff and the communities (see Appendix 2 for the details of the support provided by Water Smart).

- 3) **Dealing with challenges:** if a supporting organization decides to implement a P2P program, this organization may wish to address the P2P challenges identified by participants (e.g., the EOCP registration system, creation of resources, etc.). Consideration should be given to how to roll out the program to a regional scale to allow for collaboration between communities and the inclusion of small systems.
- 4) **Further study:** a second quantitative pilot project of larger scale and duration would be useful to see if the findings of this study hold true with a larger sample size, as well as to address those factors not covered here (e.g., quality of training, sustained behavioral change) or better address factors that were not adequately explored in this evaluation. Future study of the P2P approach could consider a broader sample size, as well as those additional elements noted in the Section 3.1 above (e.g., risk, accuracy, materials, and standards). Future investigation could also include what is appropriate to be taught through the P2P approach and what is not, in order to ensure P2P course content is appropriate.

References

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Appendix 1 – EOC Registered P2P Courses (January 2016)

Course Number	Course Name	CEU Value
8018	SCADA Basic Overview	0.2
8019	Fire Hydrant Winterizing	0.1
8020	Confined Space Safety (Evaluation)	0.3
8021	CCTV Equipment Operation	0.3
8022	Uses for CCTV Crawler Camera	0.3
8023	Flusher Truck Root Cutter Operating Procedure	0.2
8024	Vactor Truck – Water Re-circulation	0.3
8031	Installation of Robar Repair Clamp	0.1
8033	Field Kit Grab Testing Procedures	0.15
8041	Pressure Reducing Valves Components & Operation	0.2
8111	UV Reference Sensor Validation	0.4
8120	Acoustic Leak Detection	0.15
8121	CRD Pilot Control Valve Maintenance	0.1
8129	Overview of the New Denver Water Distribution System	0.25
8132	Completing a ¾" water service hot tap	0.2
8133	Piping Components	0.25
8134	Turning Off and Trouble Shooting Curb Stops	0.05
8135	Confined Space Entre – testing air in sanitary manhole	0.05
8139	Valve Stem Re-Pack	0.15
8140	Why and How to Isolate and Flush a Watermain in a Water Distribution System	0.25
8141	Taking and shipping total coliform and ecoli water samples for lab analysis	0.2
8143	Reading/Interpreting Engineered Water Drawings	0.1
8144	Utility use of BC One Call	0.1
8146	Service line thawing (hot water)	0.25
8147	Installation of Residential Water Meters	0.15
8149	Singer PRV change-over and flushing (cleaning)	0.2
8171	Hot tapping using a FORD hot tap machine	0.3
8177	Sample Field Collection – Cryptosporidium Filters	0.2
8188	Flushing Sewer Main with Jet Rodder	0.15
8189	Confined Space Gas Monitoring	0.05

Appendix 2 – Water Smart Support Provided During P2P Pilot

During the P2P pilot project, the Water Smart Coordinator provided two major areas of support for volunteer trainers:

1. Delivery of **full-day introductory workshops** intended to support volunteer trainers to:
 - understand the P2P concept;
 - complete EOCP registration as approved trainers;
 - brainstorming a long-list of viable short-duration training activities suitable for P2P delivery (*note that over 300 potential activities were brainstormed during each of the workshops*);
 - support trainers to select training activities that they would be qualified and willing to deliver as a P2P trainer;
 - develop and submit a course agenda for at least one training activity, compliant with EOCP requirements
 - These workshops were delivered in Kimberley and Nelson in order to facilitate attendance by participants from the Basin's distinct sub-regions. See agenda, next page.
 - During the workshops we provided extensive administration support to ensure that participants were able to overcome perceived barriers with the online registration process.
 - We also worked to address more personal concerns associated with individual ability to deliver P2P training (confidence boosting), focusing on a simple 5-step process for training (see side bar).
2. Provision of **one-to-one administrative support** after the workshops to address issues associated with trainer and training activity registration on EOCP's training registry.
 - Water Smart worked closely with each of the trainers to ensure that any errors in EOCP registration were rectified in a timely fashion.
 - For example, in some cases trainers submitted applications for training activities that did not match their approved Subject Matter Areas (SMAs). In other cases, there were errors that occurred in the EOCP approval process in which the trainer registration approval only captured 2 of 3 SMAs that had been submitted by the applicant. In these types of instances, Water Smart provided support to ensure that the matter was appropriately addressed.

Simplified 5 step training process

1. Trainer explains the role of the equipment and the specific component that is the topic of the training activity.
2. Trainer demonstrates the activity while describing each step.
3. Trainer coaches the trainee through the activity.
4. Trainee repeats the activity with minimal direction from instructor.
5. Trainee describes role of component, safety, and operational precautions to be taken, the process to be followed, and the tools necessary to complete the task.

As indicated in the findings at page 10 of this report, participants identified external, 3rd party support as critical to the viability of the P2P training approach. Specifically, the face-to-face and one-to-one support provided through the workshops and the post-workshop follow-up ensured that the participants were able to overcome perceived barriers, largely associated with use of the EOCP training registry - these were issues both with computer literacy or willingness to use the EOCP site, and with challenges with the actual use of the training registry website.

It is noted that the EOCP provided extensive support during this pilot project to ensure that the training registry was able to accommodate use by P2P trainer-applicants.

Peer-to-Peer Trainer Registration Workshop Agenda

Kimberley, July 15, 2015, 9:00 to 3:00 Mountain Time City of Kimberley Fire Hall [340 Spokane Street](#)

Nelson, July 16, 2015, 9:00 to 3:00 Pacific Time Hume Hotel, Lydia Room [422 Vernon Street](#)

Workshop Description

The workshops will support pilot peer-to-peer water operator trainers from Nelson, New Denver, Fernie, Kimberley, and Cranbrook, as well as some IHA personnel to:

- complete trainer registration with the EOCP
- identify 0.5-1.5 hour training activities
- develop a course agenda for at least one training activity to be registered with the EOCP
- identify and address any question or concerns with the pilot project itself

The workshop will be hosted by Meredith Hamstead and Joe McGowan.

Pilot Project Evaluation

Water Smart has engaged Sarah Breen, PhD candidate, to evaluate the peer-to-peer pilot program. The evaluation will assess the pilot project itself, **not** the individual trainers. We ask all participants in the pilot program to participate in the evaluation. Participation will be confidential. We will summarize the evaluation purpose and process at the workshops and address any questions or concerns that arise.

Time (Local)	Agenda
9:00-9:30	Welcome and Workshop Review Introductions – who’s who?
9:30-10:00	Review of pending changes to legislation – Joe McGowan
10:00-10:15	P2P Evaluation – Sarah Breen
10:15-10:30	Review of EOCP’s Recognized Trainer and Training Activity Processes <ul style="list-style-type: none"> • P2P training activity targets – who, when, how many?
10:30-12:00	Completing Recognized Trainer Applications <ul style="list-style-type: none"> • Support for completion of trainer application
12:00 – 12:30	LUNCH BREAK – Lunch will be provided by CBT
12:30-1:30	Developing EOCP Recognized Training Activities <ul style="list-style-type: none"> • Brainstorming a long list • Individual training activity selection for all trainers
1:30-2:30	Developing training activity agendas <ul style="list-style-type: none"> • Preparing to submit a training activity for EOCP review
2:30-3:00	Next Steps for Trainers? Next Steps for Water Smart?

Questions? Contact Meredith Hamstead at watersmart@cbt.org or 250.688.1150