



Audit of Skills Needs of Water Industry in NSW

A final report prepared for the NSW Department of Education and Training on behalf of the NSW Utilities and Electrotechnology Industry Training Advisory Body

© NSW Department of Education and Training 2007



Disclaimer: The views expressed in this work do not necessarily represent the views of the NSW Department of Education and Training. NSW Department of Education and Training does not give warranty nor accept any liability in relation to the content of this work.

Contents

Executive Summary	3
Introduction	6
Methodology	7
Results	8
Sample Profile	8
Awareness of the National Water Industry Training Package	9
Skills Gap Analysis	10
Reasons relevant to the identification of the future skills gaps	18
Skills and training and development programs	20
Support provided to participate	21
Barriers for employees taking up training and formal qualifications ..	22
Budget	23
Priorities	24
Training Experiences	25
Discussion and Conclusion	26
Recommendations	31
Appendix A – Data	33
Appendix B - Invitation to participate	63
Appendix C- Research Survey	64

Executive Summary

For over 10 years the NSW Utilities and Electrotechnology Industry Training Advisory Body (ITAB) has been responsible for advising NSW Department of Education and Training (DET) on the training needs of the Water Industry.

The objective of the research is to identify the current and future training needs of water operators in rural and regional NSW and identify possible training solutions that best meet these needs. This will contribute to ensuring the effective management of the precious water resources of rural and regional NSW, including the preparation of the workforce for an increased uptake of new systems and technology.

The research will also assist in determining if there is the potential for development of a long-term strategy to increase the access to skills, training and jobs by those facing barriers to participation, particularly in rural and remote communities.

Anecdotal evidence that there are some barriers to the uptake of structured training and qualifications for the Water Industry has emerged. This research is being undertaken as a first step in developing long-term workforce development and skills recognition strategies for the sector through the collection of baseline data sets of skills shortages in Local Water Utilities (LWUs), which will in turn inform strategies moving forward.

Invitations to participate were sent to all of the representatives of the member councils of the Water Directorate and 37 surveys were attempted. The duration of the survey to complete was 30-45minutes.

Key results of the research are set out below:

Sample Profile

- Half of the respondents are managers, whilst 28% are engineers and 8% directors. The remaining five respondents, represented as 'Other (14%)' comprised of individuals whose position titles varied.
- The majority of respondents (61.11%) were not aware of the National Water Industry Training Package and over 80% of respondents wanted further information about the package.
- The majority of respondents came from the Orana, Central West, Mid North Coast, North Coast Water and South West Water Directorate regions.

Skills Gaps

- Currently small skills gaps are most evident at a Certificate II or assistant operator level in water treatment, engineering, strategy and assets operational areas.
- Currently large skills gaps are most evident at a Certificate II or assistant operator level in water treatment operational areas.
- Future (5-10 years) small skills gaps are most evident at a Certificate II or assistant operator level in engineering, strategy and assets operational areas.
- Future large skills gaps are most evident at a Certificate II or assistant operator level in water treatment operational areas.
- The most identified reason for future skills gaps is identified as the ageing workforce (identified by 27% of respondents to that question), followed closely by remuneration/salary issues which are both consistent with anecdotal evidence.
- Other reasons revolved around operational and training issues and the difficulties of attracting staff.

Programs

- Of 25 respondents who answered this question over one quarter (27%) have structured training delivered offsite at their organisation and 23% onsite. TAFE courses are provided to 19% of respondent organisations and university level courses, on-the-job training and remote learning to a lesser extent.

Support

- Organisations providing time off for lectures and/or study or part financial support were all identified by the majority of respondents (76%, 52% respectively) of the 25 respondents who answered this question. Full financial support was identified by just under half of the respondents who answered this question.

Barriers for employees taking up training and formal qualifications

- Barriers for employees taking up training and formal qualifications can be attributed to budgetary and resource constraints, workforce management, the training itself and employee specific reasons.

Budget

- Twenty respondents provided data on water operations and training organisational budgetary matters. The range of the water training budget as a percentage of total training budget is from 2% till nearly 37% of those that can be calculated (total of 16) based on information provided. Of these the mean (average) is 16% of total training budget is allocated to water training and the median is 11.5%.

Priorities

- Priorities identified by respondents that could be addressed to increase employees training uptake in water industry operation qualifications include priorities for Local Water Utilities (Workforce Management and Remuneration and Benefit), the Whole-of-Government and internal training and training providers. T

Training Experience

- What has *not* worked with training included issues around quality, structure and content of training, outdated training resources and some training providers themselves.
- More positively and sometimes contradictorily to issues above, what has worked includes particular courses, on-the-job assessment and supervised distance education training packages. Other things that have worked include targeting learning to specific equipment in use and recruiting staff that have a reasonable level of education and ability to learn.
- The reasons why particular training has worked includes the ability to integrate the acquired knowledge and problem solving skills directly into the employees day-to-day work, the employer's support, the networking opportunity, post training contact with knowledgeable trainers, attributed salary increases and the tailoring of training to particular needs such as ensuring older participant's felt comfortable or that training is delivered locally to ensure less time away from family.

Recommendations are set in the Recommendation section of this report.

Introduction

Over the past 12 months the NSW Utilities and Electrotechnology Industry Training Advisory Body (ITAB) has had informal discussions with a number of people in the water industry about increasing the numbers of employees with formal qualifications. The ITAB has been advised that there are some barriers to the uptake of structured training and qualifications for the Water industry. This research was undertaken as a first step in developing long-term workforce development and skills recognition strategies for the sector through the collection of baseline data sets of skills shortages in Local Water Utilities (LWUs), which will in turn inform strategies moving forward.

Methodology

Initial investigations indicated to optimise and ensure the quality of the data high-level water operation staff would have to be targeted as the sample profile.

To achieve this the sample profile was confined to the representatives of the member councils of the Water Directorate, which can be accessed at <http://www.waterdirectorate.asn.au/members.html> .

The Membership of the Water Directorate is open to all councils and county councils providing water supply and/or sewerage services to local government areas in NSW.

An executive committee of 19 representatives, 17 elected from the membership and 2 nominated from the NSW Local Government and Shires Associations, meets on a regular basis to discuss the activities and direction of the Water Directorate.

The profile of the Water Directorate is high amongst various industry bodies with representatives attending both the LGSA's Water Management Committee and the Liaison Committee in conjunction with the Department of Energy, Utilities and Sustainability. The Water Directorate is an associate member of the Water Services Association of Australia and has established strong links with the Australian Water Association and relevant State Government Departments.¹

The research survey (Appendix C) was posted online using the web-based survey tool Survey Monkey (www.surveymonkey.com).

Invitations to Participate (Appendix B) were then emailed to all of the member council representatives of the Water Directorate. Of the 95 invitations emailed, 15 returned undelivered. These were followed up further and to the time of writing 94 invitations had been successfully emailed.

Further to this, member council representatives of the Water Directorate were preferably contacted by telephone and/or emailed again to encourage the completion of the research survey. In total 37 surveys were attempted representing nearly 40% of the member councils of the Water Directorate.

¹ http://www.waterdirectorate.asn.au/more_information.html

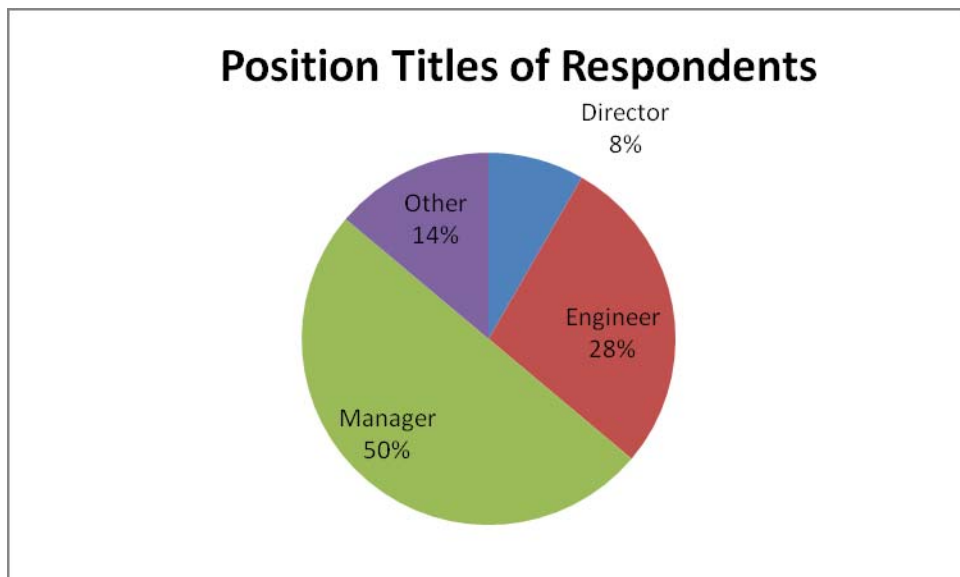
Results

All result data are in Appendix A of this report.

Sample Profile

Position Titles of Respondents

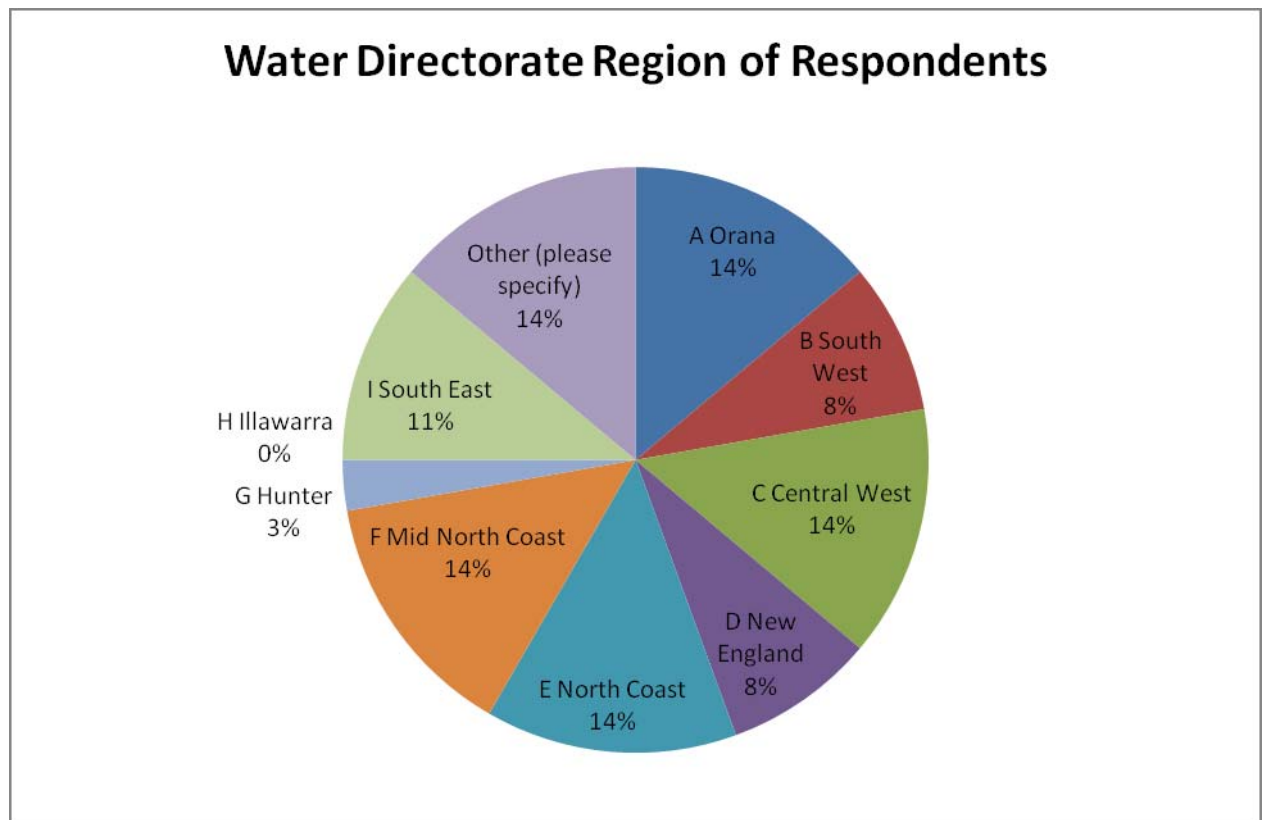
Fifty Percent (50%) of respondents are managers, whilst 28% are engineers and 8% directors. The remaining five respondents, represented as 'Other (14%)' below comprise of individuals whose position titles are Group Leader Utility Services, Water Cycle Technician, Operations Officer, Training Officer and Team Leader Water Services



Location of Respondent Local Water Utilities

There is equal representation (14%) from the Orana, Central West, Mid North Coast and the North Coast Water Directorate regions. 11% of respondents are located in the South East region and 8% for both the New England and South West regions. There was 1 respondent from the Hunter region and no representation from the Illawarra. Others representing 14% of respondents identified as Southern Tablelands, South Western Sydney, Central Coast, Murray, and Riverina.

Murray and Riverina are actually part of the South West region and when this is taken into account South West is now equal to the representation from the Orana, Central West, Mid North Coast and North Coast Water Directorate regions.



Awareness of the National Water Industry Training Package

The majority of respondents (61.11%) were not aware of the National Water Industry Training Package until they were contacted, and over 80% of respondents wanted further information about the package.²

² Information packages have been emailed to these respondents.

Skills Gap Analysis

Respondents were asked to rate the skills of employees (have now, need now, need future) at particular position levels and for particular operational areas. Skills rating categories were No Skills, Basic Skills, Average Skills, Advanced Skills or Not Applicable.

Small skills gaps exist when a skills category is one level above another e.g. Basic to Average

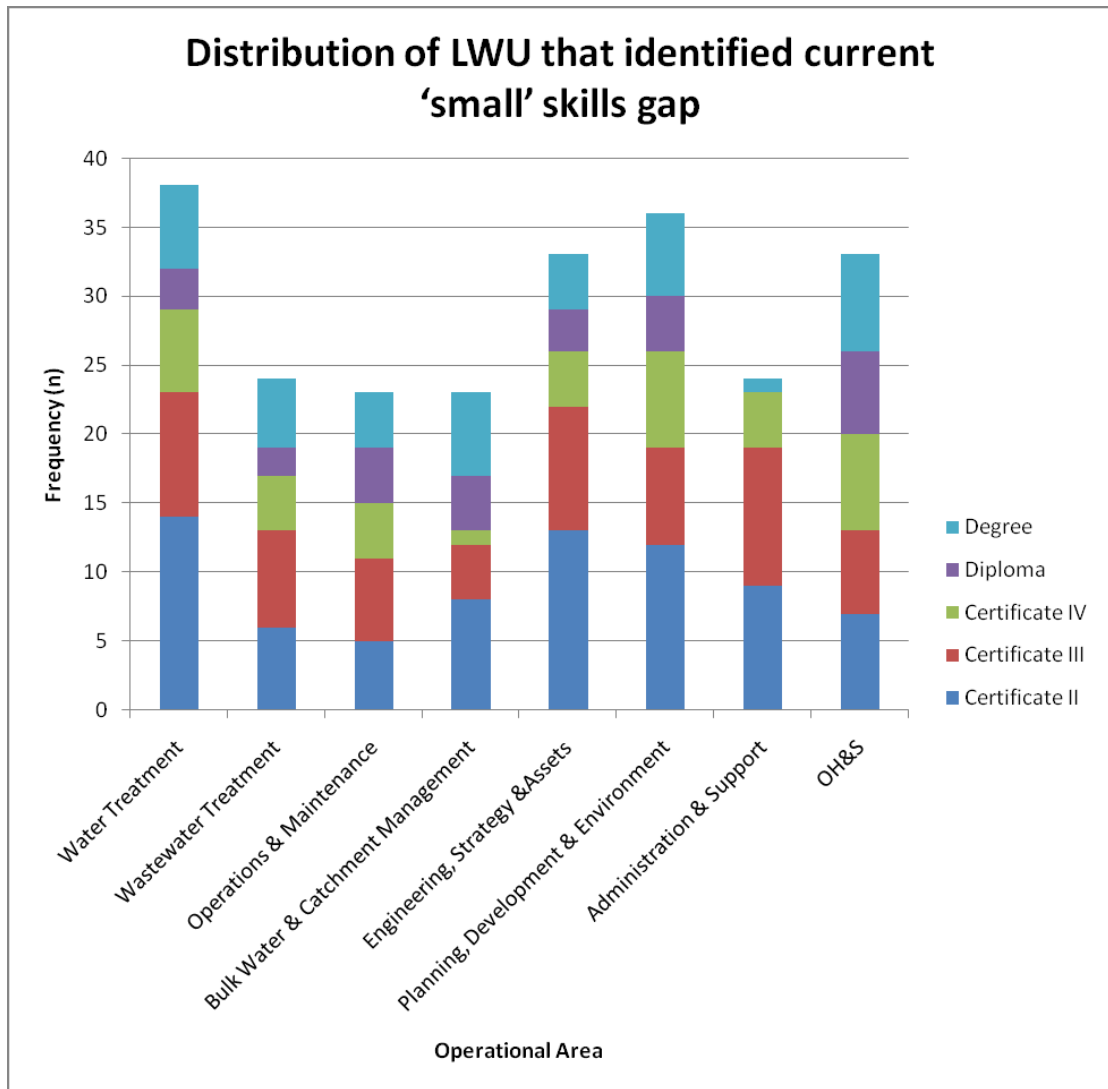
Large skills gap exist when a skills category is two or more levels above another e.g. Basic to Advanced

NOW

Small skills gaps that currently exist (have now versus need now) are identified in the following operational areas at the equivalent qualification levels by the number of LWUs represented in the blue part of the table below:

Operational Area	Number of LWU that identified current 'small' skills gap (frequency)				
	Certificate II	Certificate III	Certificate IV	Diploma	Degree
Water Treatment	14	9	6	3	6
Wastewater Treatment	6	7	4	2	5
Operations & Maintenance	5	6	4	4	4
Bulk Water & Catchment Management	8	4	1	4	6
Engineering, Strategy & Assets	13	9	4	3	4
Planning, Development & Environment	12	7	7	4	6
Administration & Support	9	10	4	0	1
OH&S	7	6	7	6	7

A graphical representation of this analysed data appears below:

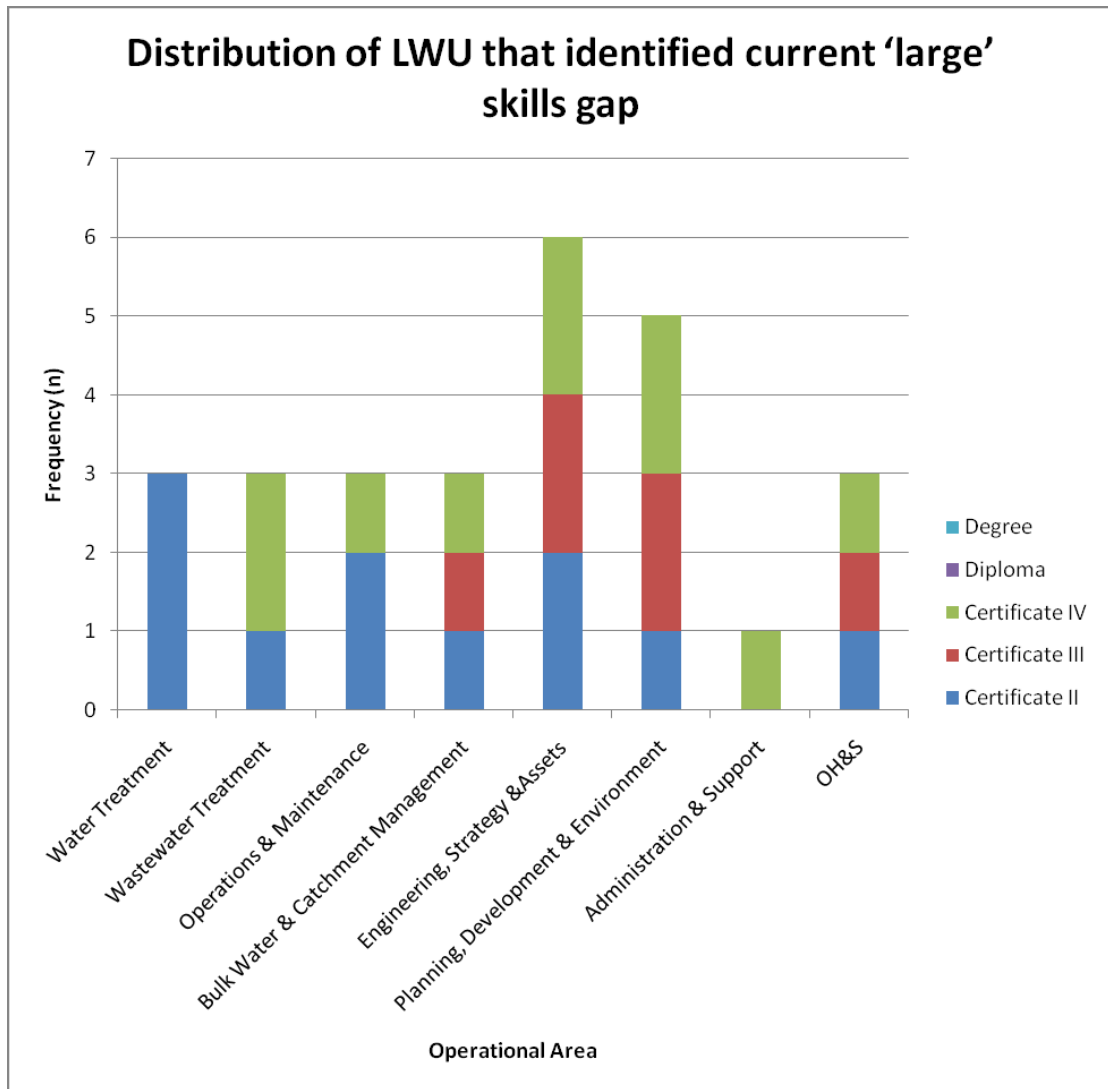


Currently small skills gaps are most evident at a Certificate II or assitant operator level in water treatment, engineering, strategy and assets operational areas.

Current (have now versus need now) large skill gaps are identified in the following operational areas at the equivalent qualification levels in the table below:

Operational Area	Number of LWU that identified a current 'large' skills gap (frequency)				
	Certificate II	Certificate III	Certificate IV	Diploma	Degree
Water Treatment	3	0	0	0	0
Wastewater Treatment	1	0	2	0	0
Operations & Maintenance	2	0	1	0	0
Bulk Water & Catchment Management	1	1	1	0	0
Engineering, Strategy & Assets	2	2	2	0	0
Planning, Development & Environment	1	2	2	0	0
Administration & Support	0	0	1	0	0
OH&S	1	1	1	0	0

A graphical representation of this analysed data appears below:



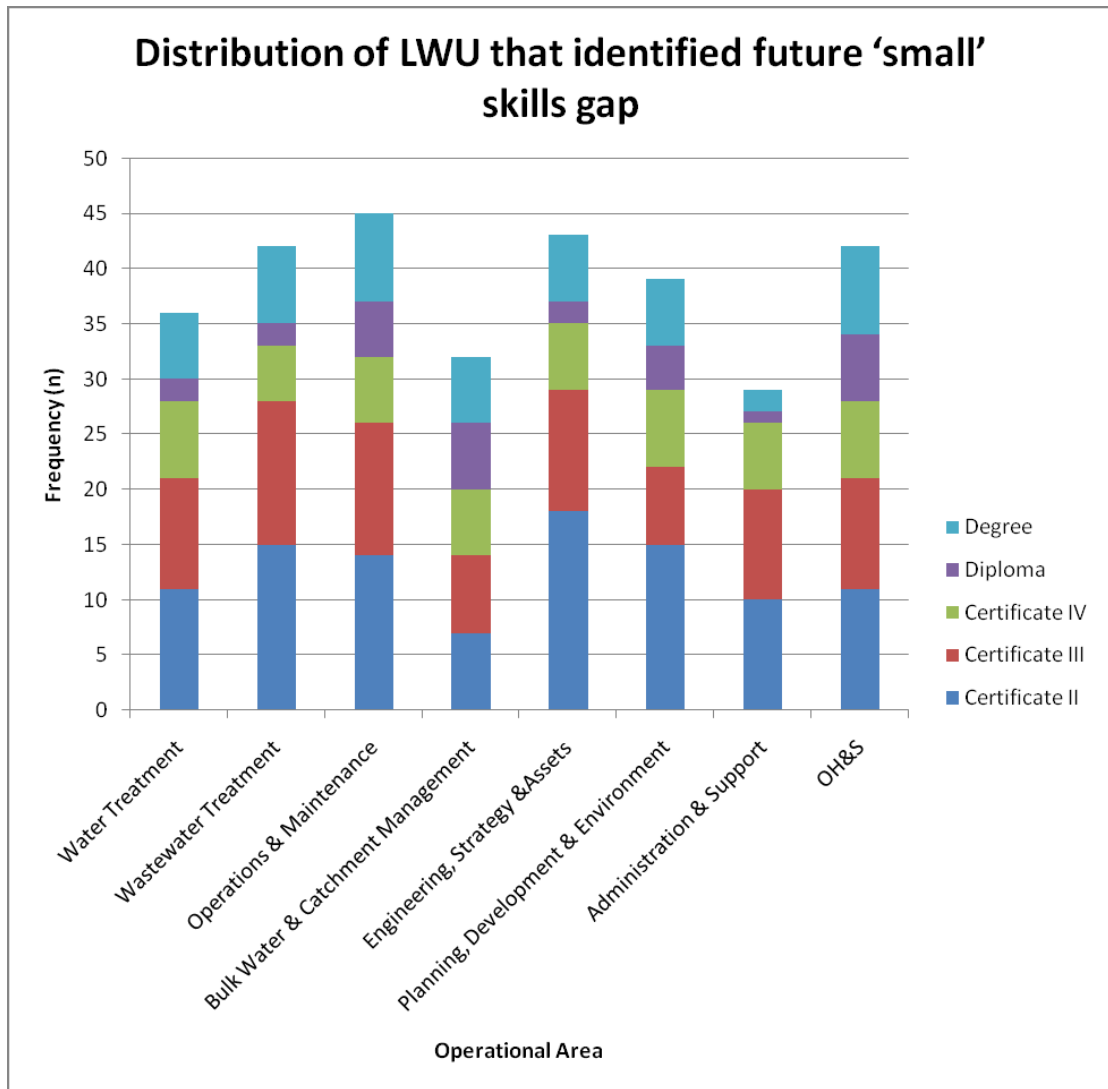
Currently large skills gaps are most evident at a Certificate II or assitant operator level in the water treatment operational area.

FUTURE

Respondents identified that small skills gaps between now and what will be required in the future (5-10 years) exist in the following operational areas of equivalent qualification levels:

Operational Area	Number of LWU that identified future 'small' skills gap (frequency)				
	Certificate II	Certificate III	Certificate IV	Diploma	Degree
Water Treatment	11	10	7	2	6
Wastewater Treatment	15	13	5	2	7
Operations & Maintenance	14	12	6	5	8
Bulk Water & Catchment Management	7	7	6	6	6
Engineering, Strategy & Assets	18	11	6	2	6
Planning, Development & Environment	15	7	7	4	6
Administration & Support	10	10	6	1	2
OH&S	11	10	7	6	8

A graphical representation of this analysed data appears below:

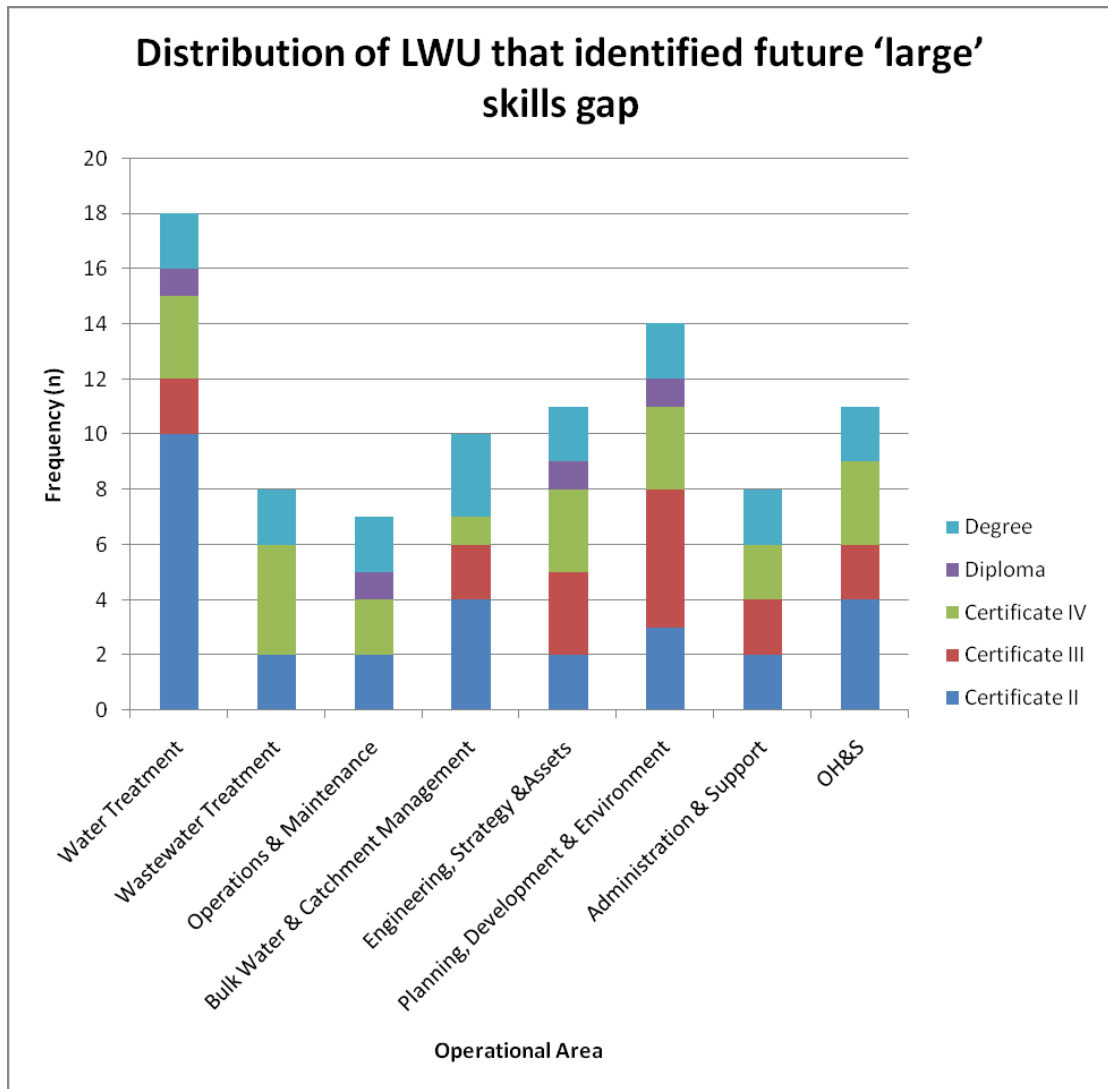


Future small skills gaps are most evident at a Certificate II or assitant operator level in engineering, strategy and assets operational areas.

Respondents identified that large skills gaps between now and what will be required in the future exist in the following operational areas at equivalent qualification levels:

Operational Area	Number of LWU that identified 'large' future skills gap (frequency)				
	Certificate II	Certificate III	Certificate IV	Diploma	Degree
Water Treatment	10	2	3	1	2
Wastewater Treatment	2	0	4	0	2
Operations & Maintenance	2	0	2	1	2
Bulk Water & Catchment Management	4	2	1	0	3
Engineering, Strategy & Assets	2	3	3	1	2
Planning, Development & Environment	3	5	3	1	2
Administration & Support	2	2	2	0	2
OH&S	4	2	3	0	2

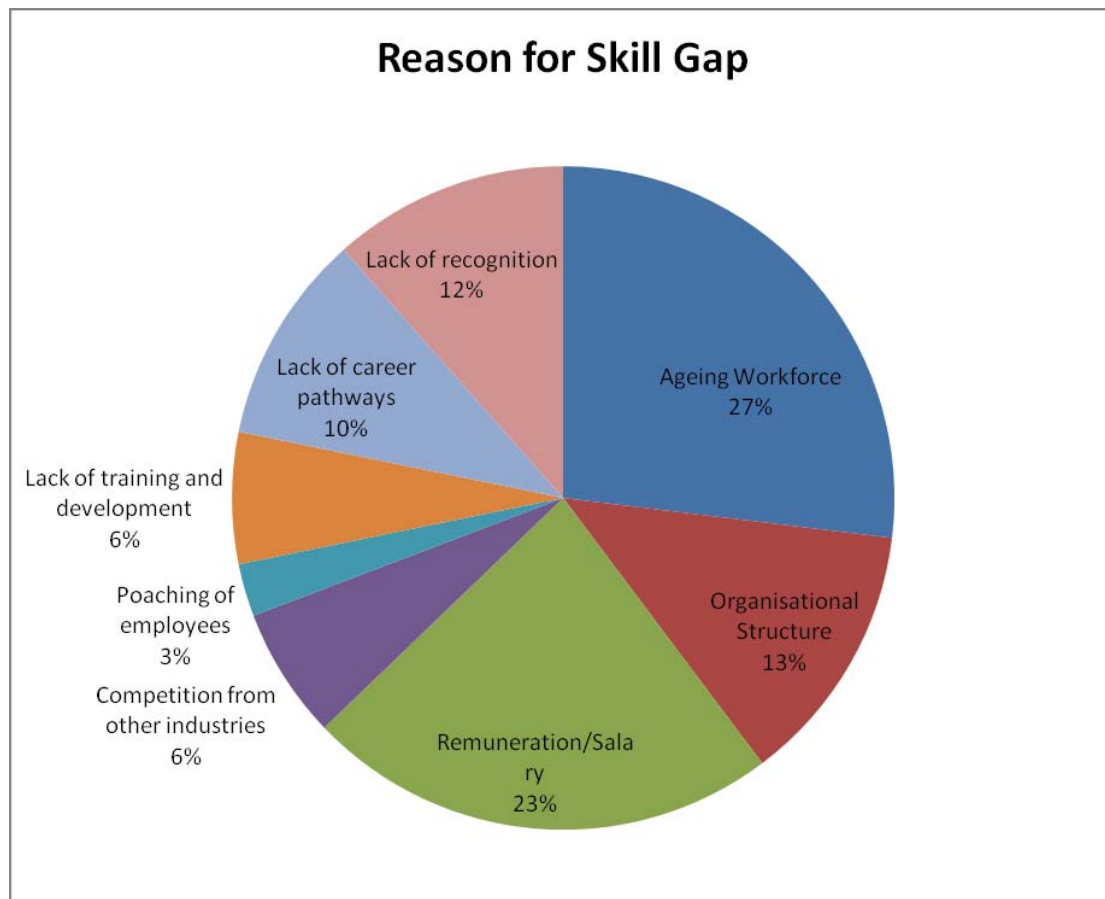
A graphical representation of this analysed data appears below:



Future large skills gaps are most evident at a Certificate II or assitant operator level in the water treatment operational area.

Reasons relevant to the identification of the future skills gaps

The most identified reason for future skills gaps is identified as the ageing workforce (identified by 27% of respondents to that question), followed by remuneration/salary issues (23%). Organisational structure, lack of recognition and career pathway reasons (10-13%) were followed by the lesser reasons of competition, training and poaching.



Other comments revolved around operational and training issues and the difficulties of attracting staff.

Operationally reasons included that the level of skill required is increasing with the increased level of technology being installed. One respondent stated that there is a need for an engineer, in their organisation to focus on strategic functions such as planning, asset management, reducing water losses and commented that the multi-skilling of other employees was popular to operate water and sewer plants whilst operators attended training.

With regard to training one respondent identified that there was a lack of suitable applicants with the required minimum education to be able to undertake training. Another respondent highlighted logistical

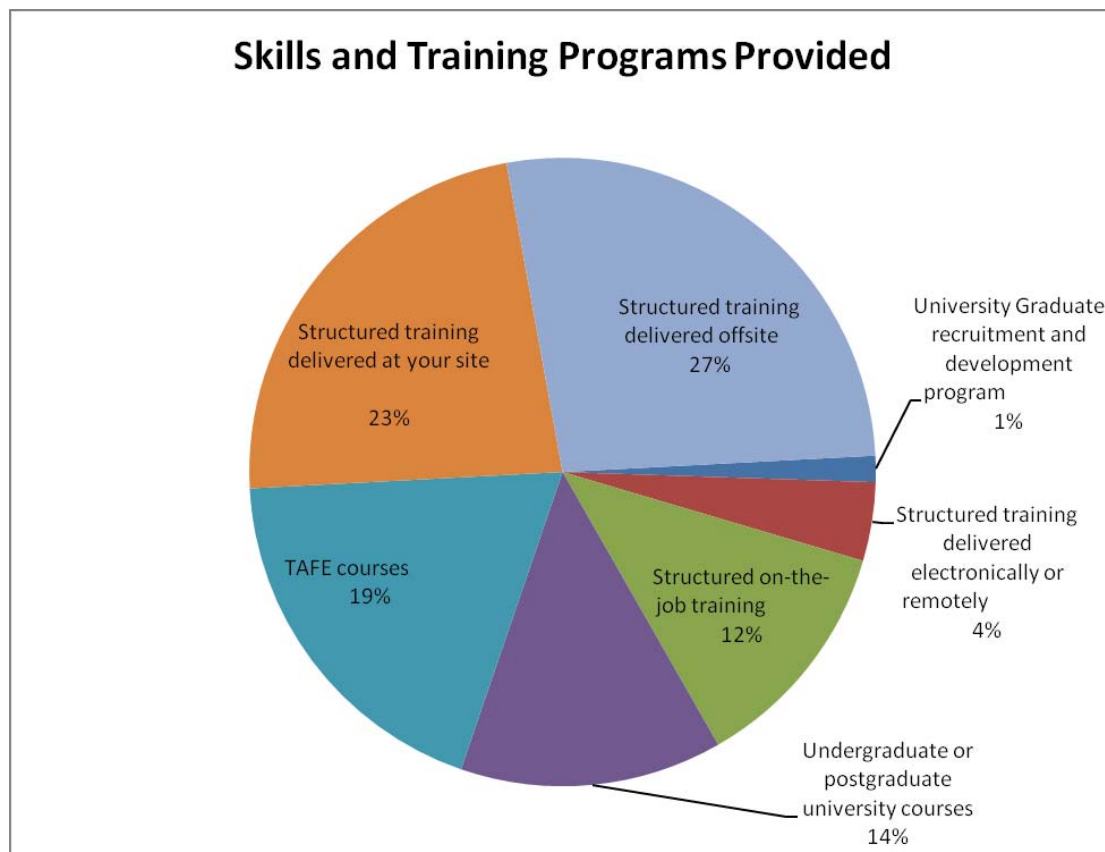
obstacles that made it difficult to attend courses stressing the need for the recognition of existing skills and knowledge and increasing on-site assessment.

Difficulties in attracting staff due to the nature of the work , geographical isolation and staff not overly interested in further training were other reasons given for the skills gap.

Skills and training and development programs

Respondents were asked what types of skills and development programs were provided in their organisation.

Twenty five respondents answered this question and of them over one quarter (27%) have structured training delivered offsite at their organisation and 23% onsite. TAFE courses are provided to 19% of respondent organisations and university level courses, on-the-job training, remote learning to a lesser extent.



The TAFE or other course qualifications specified included:

1. Supervisors' packages
2. Occupational Health & Safety
3. Technical skills training e.g. basic plumbing and backflow prevention, confined space entry
4. Chemical and manual handling certificates
5. Certificate I, II, III, IV in Water Industry Operations including through the Open Training and Education Network.
6. NSW Health courses
7. Department of Commerce courses
8. Asset Management Planning and maintenance courses
9. Department of Energy, Utilities and Sustainability courses.
10. Advanced Diploma and Diploma in Civil Engineering

Support provided to participate

Respondents were asked what support was provided to participate in skills and development programs.

Time off for lectures and/or study or part financial support were all identified by the majority of respondents (76%, 52% respectively) who answered this question. Full financial support was identified by just under half of the respondents who answered this question.

Other support included reimbursement of expenses, paid time and support to complete assignments and accommodation, meals and transport to attend. One respondent wrote that the only support was time off for exam attendance. Traineeships, with unstructured on-the-job-training, were also identified as support.

Barriers for employees taking up training and formal qualifications

Barriers for employees taking up training and formal qualifications can be attributed to budgetary and resource constraints, workforce management, the training itself and employee specific reasons.

Workforce management issues included both the lack of career opportunity and remunerated reward for completing training.

With regard to the training itself, identified was the lack of appropriate training modules with on-the job tasks coupled with the degree of difficulty and a lack of mentors. Furthermore, logistically having operators absent from work to attend courses is fraught due to lack of suitably trained staff to cover them. More positively one respondent identified that training had an increased commitment and another stated that there were two mentors for their trainee.

Employee motivation, age and length of service and demands of the job, previous education and personal commitments were also identified as barriers to training. False expectation that training meant a positive bias for job selection was also attributed as was the necessary personal investment in time and money to participate.

Budget

Twenty respondents provided data on water operations and training organisational budgetary matters. The range of the water training budget as a percentage of total training budget is from 2% till nearly 37% of those that can be calculated (total of 16) based on information provided. Of these the mean (average) is 16% of total training budget is allocated to water training and the median is 11.5%.

Water Operations Budget	Total Training Budget	Water Training Budget (either % or amount)
\$1,270,000	\$112,000	10%
5500	85000	5500
\$5,000	\$200,000	
2500000	95000	35000
\$43.1 million	?	Difficult because we have training allocated from a number of sources and types of training - not specifically water related but general.
\$1,485,103	\$106,500	\$4,000
\$500,000	50,000	15% Maybe
\$5.5million	Unsure of total - guess \$250K	at present guess of \$50K
\$900,000	\$20,000	2%
approx \$2M per annum	approx \$100k per annum	\$10k
\$24000	\$52000	13%
4,311,000	2% of salaries	5% of salaries
\$2.6 mill: Sewer \$3.3 mill	\$300,000	~ 10%
\$12,000/pa	\$120,000	10%
12 Million (ex capital works)	\$30,000	
2,000,000	150,000	Guess - 5%
\$21m	\$3m	\$1m
\$1,400,000.00	\$60,000.00	30%
\$5 million	\$50,000	\$15,000
\$1 477 000	\$60 000	20%

Priorities

Priorities identified by respondents that could be addressed to increase employees training uptake in water industry operation qualifications include priorities for Local Water Utilities (Workforce Management and Remuneration and Benefit), the Whole-of-Government and internal training and training providers. These are listed below:

Local Water Utilities (Workforce Management and Remuneration and Benefit) Priorities

- Pay increase and better pay rates
- Pay reward or promotion for successful completion of training
- Recognition
- Further support to attend and complete training
- Identifying the need for up skilling staff
- Gross difference in reward for trained personnel
- Job security and better career paths

Whole-of-Government Priorities

- Incentive and additional government funding for local government
- Government subsidies for organisations
- More jobs in this area

Training Priorities

- Increase basic level of operator education
- Establish internal training coordinators
- Recognise prior learning
- Fluoride operators certificate or fluoride units in existing qualifications
- Better correspondence training
- More structured courses by TAFE
- Better package of modules
- Training orientated to on-the-job with assessment
- Practical, targeted courses
- Specific needs training
- Free (or heavily subsidised) training
- Local training
- Training courses held on site
- Course content covering entire industry rather than traditional water or wastewater treatment as Registered Training Organisations (RTOs) have not yet started developing course materials for the new modules in the training package
- TAFE better organised
- Routine industry and basic electrical training

Training Experiences

With regard to the training experience respondents were asked to identify what had or had not worked and why it had worked.

What has not worked included issues around quality, structure and content of training, outdated training resources and the training providers themselves.

With regard to the quality of training, poor delivery and lack of adequate assessment, including attendance meaning a pass, were identified as issues. Structurally and content wise block release, self-paced distance learning and training that has not considered the lower educational levels of students has been a problem. Further to this traineeships as a means to get people off the dole and a failure to maintain a strong formal apprenticeship system were also identified as issues.

Training providers themselves were also identified as part of why training has not worked with TAFE's being disorganised and not imparting new skills to employees (big accusation – more detail please). Further to this TAFE courses were deemed subordinate to Public Works courses although they were deemed not to be as modular. Alternatives such as DEUS and OTEN courses had issues as well such as cost (at what point is cost a barrier?). Werribee College in Victoria was deemed to have a meaningful course. (Why?)

More positively, and sometimes contradictorily to issues above, what has worked includes again the Werribee College, the DEUS training, Public Works, OTEN, TAFE and the Department of Commerce courses, on-the-job assessment and supervised distance education training packages. Other things that have worked include targeting learning to specific equipment in use, occupational health and safety training and recruiting staff that have a reasonable level of education and ability to learn.

The reasons why particular training has worked includes the ability to integrate the acquired knowledge and problem solving skills directly into the employees day-to-day work, the employer's support, the networking opportunity, post training contact with knowledgeable trainers, attributed salary increases and the tailoring of training to particular needs such as ensuring older participant's felt comfortable or that training is delivered locally to ensure less time away from family.

Discussion and Conclusion

At the time of writing nearly 40% of the representatives of the member councils of the Water Directorate had responded.

The researcher received correspondence and verbal communication exemplified below identifying issues with time and length of the research survey and commitments at hand for key LWU personnel:

"...I understand the importance but I have asked the GM to include 40 hour days in this year's budget as my W&WW crew cannot keep in front of the workload generated by our ageing infrastructure. If I do manage to get time I will attack it..."

"...I am sorry at the moment I do not have time to respond to your Audit survey and it looks unlikely that this will change in the near future..."

"I can't afford the time to do the survey..." When asked to make some general comments about the situation there he said *"...I don't have a skills shortage. We have four fellas here- One is 61 and ageing and he'll be gone, the other two are 40, the other new one is young.... We spent \$105k last year on training...Staff just seem to settle in and that's that! ... We're lucky here we're surrounded by three TAFE's (he then named them) and I think its Certificate IV..."*

The inaugural NSW Water Industry Operators Association³ Conference was held through the concluding month of this research. The conference was attended by 111 delegates with almost equal representation by operators, coordinators, managers and engineers.

The conference aimed to

- Distribute the latest "operational" technical and research based information through platform and poster presentations.
- Update the knowledge and skills plus network development by operations staff through interaction with fellow Water Industry employees and
- Provide the opportunity to view and discuss the latest advances in technical equipment and systems with suppliers and trade consultants.

Dr Peter Mosse, Principal of Hydrological, delivered the key note address "Operational Awareness and Responsiveness" highlighting the

³ <http://www.wioa.org.au>

increasing expectations of operators (surrounding public health concerns, drought management and demands) that require an increased awareness by managers and others of the needs of water operators. Dr Mosse said that a lot of problems in the Water Industry exist because there is a management culture that doesn't understand what needs to be done at an operator level.

Dr Mosse is involved in the Australian Water Treatment Alliance (WTA) which is an initiative of the Australian Water Association, the Water Services Association of Australia and the Co-operative Research Centre for Water Quality & Treatment. The WTA initiative is designed to improve the performance of water treatment plants and the public safety of water supplies through a flexible, self improvement program designed to allow participants to progress at their own rate. In addition the WTA runs workshops in areas critical to the optimisation and operation of water treatment plants and water supply systems in general.

In relation to training Dr Mosse specified the need for graphical interpretation skills so that water treatment operators could plot their own data sets in spreadsheet programs so as to view data across time and take additional data sets either side of required license sets. Dr Mosse emphasised the need for operators to focus more on the outcomes for the consumer and the environment than the regulations. For example operators could comply with the Victorian *Safe Drinking Water Act 2003* and not have to filter which could allow water with pathogens (such as *Cryptosporidium* and *Giardia*) at the end user.

The nexus of Dr Mosse's comments and the results of the skills gap analysis (heavily weighted towards increasing water treatment skills) lead to the recommendation number seven, at the end of this report, that the ITAB develop an alliance with the WTA to develop strategies to encourage the participation of LWUs in their continuous self improvement program.

In a paper⁴ delivered by the Supervisor of Sewerage Plants and Pump Stations, Wingecarribee Shire Council, Mr Chris Carlon spoke of the frustrations that a new plant upgrade had given operators. From the outset, operators were not engaged in the design phase of the new plant and the Asset Manager had not allocated sufficient funds to iron out "teething problems" incorporating the need for staff to be given training for the new process and equipment which included the need for chemical dosing. Six years on the plant now consistently achieves

⁴ Carlon, C and Cochrane, D (2007) *Mittagong Regional Sewerage Scheme Upgrade and Commissioning*. Inaugural NSW Water Industry Engineers and Operators Conference proceedings.

license conditions. Mr Carlson's call for operators to be consulted in such circumstances was very well received and concurred with by the delegates present.

This highlights that training needs are also contingent on equipment upgrades and leads into recommendation number eight, at the end of this report, that the ITAB develop routine annual correspondence to LWU Asset Managers to ensure budget allocations for training are developed over the longer term and with input from those decisions they make that can bear the greatest impact on immediate skill requirements.

Further to this research survey results indicated the following:

Sample Profile

- Half of the respondents are managers, whilst 28% are engineers and 8% directors. The remaining five respondents, represented as 'Other (14%)' comprised of individuals whose position titles varied.
- The majority of respondents (61.11%) were not aware of the National Water Industry Training Package and over 80% of respondents wanted further information about the package.
- The majority of respondents came from the Orana, Central West, Mid North Coast, North Coast Water and South West Water Directorate regions.

Skills Gaps

- Currently small skills gaps are most evident at a Certificate II or assitant operator level in water treatment, engineering, strategy and assets operational areas.
- Currently large skills gaps are most evident at a Certificate II or assitant operator level in water treatment operational areas.
- Future small skills gaps are most evident at a Certificate II or assitant operator level in engineering, strategy and assets operational areas.
- Future large skills gaps are most evident at a Certificate II or assitant operator level in water treatment operational areas.
- The most identified reason for future skills gaps is identified as the ageing workforce (identified by 27% of respondents to that question), followed closely by remuneration/salary issues which are both consistent with anecdotal evidence.
- Other reasons revolved around operational and training issues and the difficulties of attracting staff.

Programs

- Of 25 respondents who answered this question over one quarter (27%) have structured training delivered offsite at their

organisation and 23% onsite. TAFE courses are provided to 19% of respondent organisations and university level courses, on-the-job training and remote learning to a lesser extent.

Support

- Organisations providing time off for lectures and/or study or part financial support were all identified by the majority of respondents (76%, 52% respectively) of the 25 respondents who answered this question. Full financial support was identified by just under half of the respondents who answered this question.

Barriers for employees taking up training and formal qualifications

- Barriers for employees taking up training and formal qualifications can be attributed to budgetary and resource constraints, workforce management, the training itself and employee specific reasons.

Budget

- Twenty respondents provided data on water operations and training organisational budgetary matters. The range of the water training budget as a percentage of total training budget is from 2% till nearly 37% of those that can be calculated (total of 16) based on information provided. Of these the mean (average) is 16% of total training budget is allocated to water training and the median is 11.5%.

Priorities

- Priorities identified by respondents that could be addressed to increase employees training uptake in water industry operation qualifications include priorities for Local Water Utilities (Workforce Management and Remuneration and Benefit), the Whole-of-Government and internal training and training providers. T

Training Experience

- What has *not* worked with training included issues around quality, structure and content of training, outdated training resources and some training providers themselves.
- More positively and sometimes contradictorily to issues above, what has worked includes particular courses, on-the-job assessment and supervised distance education training packages. Other things that have worked include targeting learning to specific equipment in use and recruiting staff that have a reasonable level of education and ability to learn.
- The reasons why particular training has worked includes the ability to integrate the acquired knowledge and problem solving skills directly into the employees day-to-day work, the employer's support, the networking opportunity, post training contact with

knowledgeable trainers, attributed salary increases and the tailoring of training to particular needs such as ensuring older participant's felt comfortable or that training is delivered locally to ensure less time away from family.

Recommendations

1. Investigate co-operative multi-departmental (Commonwealth, State) options to assist funding Local Water Utilities (LWUs) to conduct individual Training Needs Analyses to identify present training needs for individual water operators.
2. Develop strategies to assist LWUs to overcome some skill shortages in the immediate future, like up-skilling and 'just in time' training for current employees, including brokering training options on behalf of a number of LWUs in order to reduce cost.
3. Coordinate the development of an industry-wide communication strategy to increase opportunities for Local Water Utilities in attracting younger (generation x and y) employment candidates and investigate opportunities for school based traineeships and/or the promotion of the (soon to be endorsed) Certificate I in Environmental Sustainability⁵ aimed at VET in Schools Programs.
4. Coordinate the development and implementation of an informal communication strategy, using the existing web-based Water Directorate discussion forum⁶, to immediately:
 - (a) Increase water operator awareness about formal qualification pathways and
 - (b) Increase water operator awareness about Recognition of Prior Learning.
5. Investigate the linking of further support and/or research with Recommendation 1 to ensure both 'real-time' continuous improvement feed-in and tracking of skill gap fluctuations.
6. Develop a Water Training Directory, targetted to water operators, listing contact details and training modes of all Registered Training Organisations who provide training in qualifications or units of NWP01⁷ and others such as the Department of Energy, Utilities and Sustainability and Water Treatment Alliance (WTA) courses and workshops.

⁵ http://www.governmentskills.com.au/dmdocuments/water-industry/nwp1_-_final_dec-1.doc

⁶

<http://www.waterdirectorate.asn.au/maillinglist/index.php?method=showhtmllist&list=thread&rollid=1&clearoff=1&>

⁷ <http://www.ntis.gov.au/Default.aspx?/trainingpackage/NWP01/provider&state=01>

7. Develop an alliance with the WTA to develop strategies to encourage the participation of LWUs in the continuous self improvement program.
8. Develop ongoing routine annual correspondence sensitive to LWU Asset Managers to ensure budget allocations for training are developed over the longer term and with input from their decisions.

Appendix A – Data

1. What is your name?	
answer options	Response Count
	35
<i>answered question</i>	35
<i>skipped question</i>	2

2. What is your position title?	
answer options	Response Count
	36
<i>answered question</i>	36
<i>skipped question</i>	1

Respondents	
1	Manager of Water and Sewerage
2	Group Leader Utility services
3	Water Cycle Technician
4	Manager Engineering
5	Manager Works & Services
6	Water and Sewerage Manager
7	Group Manager
8	Engineer Utilities
9	Operations Manager
10	Manager Engineering Services
11	Services Engineer
12	Capital Works Engineer
13	Assistant Engineer
14	Water Supply Operations Engineer
15	Services Planning Engineer

16	Director Engineering services
17	Manager Water and Wastewater
18	Trainee Engineer
19	Manager Asset Services
20	Operations Manager - Water and Wastewater
21	OPERATIONS OFFICER
22	Water and Sewer Engineer - Operations
23	Training Officer
24	Manager Operations Water
25	Manager of Water and Wastewater
26	Water Services Manager
27	Team Leader Water Services
28	Manager Engineering
29	Director Engineering and Recreational Services
30	Manager, Operations
31	Water & Wastewater Engineer
32	Manager, Water & Sewer Business
33	Manager Assets - Engineering Services
34	Director Technical Services
35	Operations Engineer
36	technical services manager

3. In which water directorate region is your organisation?		
answer options	Response Percent	Response Count
A Orana	13.89%	5
B South West	8.33%	3
C Central West	13.89%	5
D New England	8.33%	3
E North Coast	13.89%	5
F Mid North Coast	13.89%	5
G Hunter	2.78%	1
H Illawarra	0.00%	0
I South East	11.11%	4
Other (please specify)	13.89%	5
<i>answered question</i>		36
<i>skipped question</i>		1

Other (please specify)
Southern Tablelands
South Western Sydney
Murray
Central Coast
Riverina

4. Your contact details (email, phone):	
answer options	Response Count
	34
<i>answered question</i>	34
<i>skipped question</i>	3

5. Did you know about the National Water Industry Training Package prior to receiving the email regarding this research?		
answer options	Response Percent	Response Count
Yes	38.89%	14
No	61.11%	22
<i>answered question</i>		36
<i>skipped question</i>		1

6. Do you want further information about the National Water Industry Training Package?		
answer options	Response Percent	Response Count
Yes	83.33%	30
No	16.67%	6
<i>answered question</i>		36
<i>skipped question</i>		1

7. Please rate the skills in your organisation for Assistant-Operator Employees eg. Assistant Water Treatment Plant Operator in the following operational areas:

Has Now						
answer options	No Skills	Basic Skills	Average Skills	Advanced Skills	Not Applicable	Response Count
Water Treatment	3	10	13	3	2	31
Wastewater Treatment	1	5	18	5	1	30
Operations & Maintenance	1	5	19	3	2	30
Bulk Water & Catchment Management	7	7	5	1	10	30
Engineering, Strategy & Assets	8	7	7	2	6	30
Planning, Development & Environment	11	7	4	2	6	30
Administration & Support	5	11	6	3	5	30
OH&S	1	5	19	4	2	31
Needs Now						
answer options	No Skills	Basic Skills	Average Skills	Advanced Skills	Not Applicable	Response Count
Water Treatment	0	4	13	11	3	31
Wastewater Treatment	0	4	15	10	1	30
Operations & Maintenance	0	3	17	8	2	30
Bulk Water & Catchment Management	3	6	9	2	9	29
Engineering, Strategy & Assets	3	8	3	10	6	30
Planning, Development & Environment	4	11	3	6	6	30
Administration & Support	2	10	8	5	5	30
OH&S	0	0	23	6	2	31

Disclaimer: The views expressed in this work do not necessarily represent the views of the NSW Department of Education and Training. NSW Department of Education and Training does not give warranty nor accept any liability in relation to the content of this work.

Needs to have in future						
answer options	No Skills	Basic Skills	Average Skills	Advanced Skills	Not Applicable	Response Count
Water Treatment	1	0	7	20	3	31
Wastewater Treatment	0	3	8	19	1	31
Operations & Maintenance	0	1	12	15	2	30
Bulk Water & Catchment Management	3	3	10	4	9	29
Engineering, Strategy & Assets	1	7	5	11	6	30
Planning, Development & Environment	2	8	7	7	6	30
Administration & Support	0	11	7	7	5	30
OH&S	0	0	15	12	4	31

Response totals	
<i>answered question</i>	31
<i>skipped question</i>	6

8. Please rate the skills in your organisation for Operator Employees eg. Water Treatment Plant Operator in the following operational areas:

Has Now						
answer options	No Skills	Basic Skills	Average Skills	Advanced Skills	Not Applicable	Response Count
Water Treatment	0	2	16	8	2	28
Wastewater Treatment	0	2	15	9	1	27
Operations & Maintenance	0	2	16	9	0	27
Bulk Water & Catchment Management	4	5	9	1	7	26
Engineering, Strategy & Assets	7	11	5	1	3	27
Planning, Development & Environment	7	10	3	3	3	26
Administration & Support	4	12	5	3	2	26
OH&S	1	4	18	4	0	27
Needs Now						
answer options	No Skills	Basic Skills	Average Skills	Advanced Skills	Not Applicable	Response Count
Water Treatment	0	3	7	17	1	28
Wastewater Treatment	0	1	10	15	1	27
Operations & Maintenance	0	0	14	13	0	27
Bulk Water & Catchment Management	2	4	11	3	5	25
Engineering, Strategy & Assets	2	11	7	4	3	27
Planning, Development & Environment	3	11	4	6	2	26
Administration & Support	2	7	12	4	1	26
OH&S	0	2	18	7	0	27

Needs to have in Future						
answer options	No Skills	Basic Skills	Average Skills	Advanced Skills	Not Applicable	Response Count
Water Treatment	0	1	6	20	1	28
Wastewater Treatment	0	2	4	21	0	27
Operations & Maintenance	0	0	8	19	0	27
Bulk Water & Catchment Management	2	2	10	5	6	25
Engineering, Strategy & Assets	1	7	11	4	3	26
Planning, Development & Environment	2	5	10	6	2	25
Administration & Support	1	7	12	5	1	26
OH&S	0	1	13	13	0	27

Response totals	
<i>answered question</i>	28
<i>skipped question</i>	9

9. Please rate the skills in your organisation for Co-ordinator Employees eg. Water Treatment Co-ordinator in the following operational areas:

Has Now						
answer options	No Skills	Basic Skills	Average Skills	Advanced Skills	Not Applicable	Response Count
Water Treatment	0	4	7	5	5	21
Wastewater Treatment	0	5	5	6	4	20
Operations & Maintenance	1	1	9	6	3	20
Bulk Water & Catchment Management	1	2	9	0	8	20
Engineering, Strategy & Assets	2	6	5	2	5	20
Planning, Development & Environment	3	6	4	2	5	20
Administration & Support	1	4	8	3	4	20
OH&S	0	4	11	2	3	20
Needs Now						
answer options	No Skills	Basic Skills	Average Skills	Advanced Skills	Not Applicable	Response Count
Water Treatment	0	1	7	8	2	18
Wastewater Treatment	0	0	7	9	2	18
Operations & Maintenance	0	0	8	9	1	18
Bulk Water & Catchment Management	0	1	11	0	6	18
Engineering, Strategy & Assets	0	3	9	3	3	18
Planning, Development & Environment	0	4	6	5	3	18
Administration & Support	0	1	12	2	3	18

OH&S	0	0	10	7	1	18
------	---	---	----	---	---	----

Needs to have in Future						
answer options	No Skills	Basic Skills	Average Skills	Advanced Skills	Not Applicable	Response Count
Water Treatment	0	0	2	14	2	18
Wastewater Treatment	0	1	2	14	1	18
Operations & Maintenance	0	0	3	14	1	18
Bulk Water & Catchment Management	0	0	8	4	6	18
Engineering, Strategy & Assets	0	2	7	6	3	18
Planning, Development & Environment	0	2	8	5	3	18
Administration & Support	0	1	8	6	3	18
OH&S	0	0	6	11	1	18

Response totals	
<i>answered question</i>	21
<i>skipped question</i>	16

10. Please rate the skills in your organisation for Technologist or Specialist Employees eg. Water Treatment Technologist, Water Quality Specialist in the following operational areas:

Has Now						
answer options	No Skills	Basic Skills	Average Skills	Advanced Skills	Not Applicable	Response Count
Water Treatment	0	1	3	7	11	22
Wastewater Treatment	0	0	3	7	11	21
Operations & Maintenance	1	0	5	5	10	21
Bulk Water & Catchment Management	0	1	7	2	11	21
Engineering, Strategy & Assets	1	0	3	6	11	21
Planning, Development & Environment	1	0	4	5	11	21
Administration & Support	0	0	4	6	11	21
OH&S	0	1	5	6	9	21
Needs Now						
answer options	No Skills	Basic Skills	Average Skills	Advanced Skills	Not Applicable	Response Count
Water Treatment	0	0	2	9	6	17
Wastewater Treatment	0	0	1	10	5	16
Operations & Maintenance	0	1	2	8	6	17
Bulk Water & Catchment Management	0	1	4	6	6	17
Engineering, Strategy & Assets	0	1	1	10	5	17
Planning, Development & Environment	0	1	2	8	6	17
Administration & Support	0	0	4	6	7	17

OH&S	0	0	3	8	7	18
------	---	---	---	---	---	----

Needs to have in Future						
answer options	No Skills	Basic Skills	Average Skills	Advanced Skills	Not Applicable	Response Count
Water Treatment	0	0	1	10	6	17
Wastewater Treatment	0	0	2	10	4	16
Operations & Maintenance	0	0	2	10	5	17
Bulk Water & Catchment Management	0	1	2	8	6	17
Engineering, Strategy & Assets	0	0	3	9	5	17
Planning, Development & Environment	0	0	2	11	4	17
Administration & Support	0	0	4	7	6	17
OH&S	0	0	2	10	6	18

Response totals	
<i>answered question</i>	22
<i>skipped question</i>	15

11. Please rate the skills in your organisation for Degree Qualified Employees eg. Process Engineer, Hydrologist in the following operational areas:

Have Now						
answer options	No Skills	Basic Skills	Average Skills	Advanced Skills	Not Applicable	Response Count
Water Treatment	0	2	7	9	6	24
Wastewater Treatment	0	1	8	8	5	22
Operations & Maintenance	0	1	9	9	3	22
Bulk Water & Catchment Management	0	2	11	3	6	22
Engineering, Strategy & Assets	0	0	10	9	3	22
Planning, Development & Environment	0	1	9	9	3	22
Administration & Support	0	1	7	10	4	22
OH&S	0	0	13	5	4	22
Needs Now						
answer options	No Skills	Basic Skills	Average Skills	Advanced Skills	Not Applicable	Response Count
Water Treatment	0	0	6	13	3	22
Wastewater Treatment	0	0	5	13	2	20
Operations & Maintenance	0	1	5	13	1	20
Bulk Water & Catchment Management	0	1	7	10	3	21
Engineering, Strategy & Assets	0	0	7	13	1	21
Planning, Development & Environment	0	0	5	15	1	21
Administration & Support	0	1	6	11	3	21

OH&S	0	0	6	12	3	21
------	---	---	---	----	---	----

Needs to have in Future						
answer options	No Skills	Basic Skills	Average Skills	Advanced Skills	Not Applicable	Response Count
Water Treatment	0	0	2	18	3	23
Wastewater Treatment	0	0	4	16	2	22
Operations & Maintenance	0	1	2	18	1	22
Bulk Water & Catchment Management	0	1	6	12	4	23
Engineering, Strategy & Assets	0	0	4	18	1	23
Planning, Development & Environment	0	0	5	17	1	23
Administration & Support	0	1	6	13	3	23
OH&S	0	0	5	15	3	23

Response totals	
<i>answered question</i>	25
<i>skipped question</i>	12

12. Are any of the following reasons relevant to the identification of the future skills gaps identified above?		
answer options	Response Percent	Response Count
Ageing Workforce	84.00%	21
Organisational Structure	40.00%	10
Remuneration/Salary	72.00%	18
Competition from other industries	20.00%	5
Poaching of employees	8.00%	2
Lack of training and development	20.00%	5
Lack of career pathways	32.00%	8
Lack of recognition	36.00%	9
<i>answered question</i>		25
<i>skipped question</i>		12

13. Are there any other reasons or comments?	
answer options	Response Count
	9
<i>answered question</i>	9
<i>skipped question</i>	28

Respondents	
1	<p>Many of the higher level positions do not exist in the Council</p> <p>Package modules in handy format do not exist</p>
2	<p>1. Location and isolation. Difficult to attract applicants.</p> <p>2. Lack of suitable applicants with required minimum education to be able to undertake training.</p>
3	<p>Technology is increasing and you therefore require a higher level of skills in certain areas. We are installing plants with higher levels of technology.</p>
4	<p>Need to add an engineer to the organisation to focus on strategic functions such as planning, asset management, reducing water losses.</p>

Disclaimer: The views expressed in this work do not necessarily represent the views of the NSW Department of Education and Training. NSW Department of Education and Training does not give warranty nor accept any liability in relation to the content of this work.

5	The use of multi skilled employees to run water or sewer and relieve in the other areas is popular
6	The nature of the work (particularly sewerage operations)
7	Difficulty with attending courses not offered in regional areas, small number of staff makes it difficult to have people absent for long periods for courses, need more on site assessment and recognition of existing skills and knowledge.
8	Staff not overly interested in further training
9	Limited scope for numerous skilled employees in small Council organisations, due to economics you can only have a limited number getting regular experience. Also lack of interest from the general workforce in the Water and Sewer areas, possibly because they are very responsible positions and require a significant degree of after hours commitments.

14. What skills and training and development programs does your organisation provide for employees? (Please check all that apply)		
answer options	Response Percent	Response Count
Structured training delivered at your site	68.00%	17
Structured training delivered offsite	80.00%	20
Structured training delivered electronically or remotely	12.00%	3
Structured on-the-job training	36.00%	9
Undergraduate or postgraduate university courses	40.00%	10
TAFE courses (please specify qualifications in box below)	56.00%	14
Seminars or conferences	80.00%	20
University Graduate recruitment and development program	4.00%	1
TAFE Course Qualifications and/or Other programs (please specify)	64.00%	16
answered question		25
skipped question		12

TAFE Course Qualifications and/or Other programs (please specify)
supervisors packages,
OHS
Technical skills eg basic plumbing and backflow prevention, confined space entry,
chemical handling
Manual handling
Certificate III Water industry operations
Certificate 3 & 4
TAFE Certificate courses - to cert IV at present for operators
Water and Sewerage Modules 1 and 2
Cert II & III Water Industry Operations
Operations Staff - Water Industry Operations Certificate III and IV
Advanced Diploma of Civil Engineering
DEUS and NSW Health courses etc
water and wastewater courses through OTEN, Department of Commerce and Health Department
Water 2, 3 & 4
Nil comment
Our water maintenance operator has been attending a Cert III course in water mains and services installation and mtce. Operators have generally gone through the DEUS sponsored 5 day courses for STP & WTW operators.
Water Industry Operators Certificate
Diploma in Civil Engineering
water and wastewater treatment

15. What support does your organisation give to employees to participate in those skills and development programs above? (Please check all that apply)		
answer options	Response Percent	Response Count
Time off for lectures and/or study	76.00%	19
Full financial support	48.00%	12
Part-financial support	52.00%	13
Unsure	4.00%	1
Other (please specify)	28.00%	7
answered question		25
skipped question		12

Other (please specify)
Recognition that the org. needs to be a learning org.

Paid time to attend,plus expenses etc.
Paid time and support to do assignments,
Support depends on courses and relevance to job
Traineeship includes formal course training as well as unstructured on the job training.
time off for exam attendance only
Traineeships leading to Water Industry Operations Certificate III
Also accommdation
Paid time off to attend lectures, plus accomodation and meals, and transport.

16. Please identify any barriers for employees taking up training and formal qualifications in your organisation (for example lack of career opportunities and/or mentors, budget constraints)	
answer options	Response Count
	18
<i>answered question</i>	18
<i>skipped question</i>	19

Respondents	
1	<p>Employee motivation,</p> <p>False expectation that training means positive bias for job selection,</p> <p>Lack of appropriate training modules that contain / require on the job completion of work tasks and mentoring.</p> <p>Important that the works supervisor participates in developing the new skills for the trainees</p>
2	<p>Budget constraints</p> <p>Lack of staff resources</p>
3	<p>No mentors locally.</p> <p>Difficult to access resources in more remote locations.</p>

4	The main barrier to support is really that it would benefit the organisation.
5	Limited number of positions available in small organisation but there is some progression - mainly if someone leaves. Trainee has 2 mentors who are the qualified operators. There are budget constraints but training has an increased commitment.
6	Correct, lack of mentors and degree of difficulty, coupled with formal training
7	does not necessarily allow a pay rise, however requires investment of own time and money to obtain higher qualifications
8	Budget Constraints Age and length of service of workforce
9	Budget constraints due to less income (small council).
10	the main issue is with the operators and below where it is extremely difficult to have them absent from work to attend courses due to lack of suitably trained staff to cover for them. Need localised on site training and assessment, the cost is not the problem.
11	If training is required to fulfill duties it is always approved in the water and waste section. In general training is provided across Councils within reason.
12	Also, lack of time and personal commitments
13	(Need to be directly job related if it is to be sponsored by Council. Also many employees have limited educational backgrounds and do not feel comfortable undertaking structured training.
14	Work / Life / Balance
15	Pay structure, lack of career options
16	Budget constraints, lack of mentors
17	lack of career opportunities, historic poor levels of remuneration
18	distance

17. What is your organisation's budget allocated to water industry operations?	
answer options	Response Count
	20
<i>answered question</i>	20
<i>skipped question</i>	17

Respondents	
1	\$1,270,000
2	5500
3	\$5,000
4	2500000
5	\$43.1 million
6	\$1,485,103
7	\$500,000
8	\$5.5million
9	\$900,000
10	approx \$2M per annum
11	\$24000
12	4,311,000
13	\$2.6 mill: Sewer \$3.3 mill
14	\$12,000/pa
15	12 Million (ex capital works)
16	2,000,000
17	\$21m
18	\$1,400,000.00
19	\$5 million
20	\$1 477 000

18. What is your organisation's budget allocated to training in total?	
answer options	Response Count
	20

<i>answered question</i>	20
<i>skipped question</i>	17

Respondents	
1	\$112,000
2	85000
3	\$200,000
4	95000
5	?
6	\$106,500
7	50,000
8	Unsure of total - guess \$250K
9	\$20,000
10	approx \$100k per annum
11	\$52000
12	2% of salaries
13	\$300,000
14	\$120,000
15	\$30,000
16	150,000
17	\$3m
18	\$60,000.00
19	\$50,000
20	\$60 000

19. Do you know, or could you estimate approximately (amount or percentage), the amount allocated to water industry training in your organisation?	
answer options	Response Count
	18
<i>answered question</i>	18
<i>skipped question</i>	19

Respondents	
1	10%
2	5500
3	35000

4	Difficult because we have training allocated from a number of sources and types of training - not specifically water related but general.
5	\$4,000
6	15% Maybe
7	at present guess of \$50K
8	2%
9	\$10k
10	13%
11	5% of salaries
12	~ 10%
13	10%
14	Guess - 5%
15	\$1m
16	30%
17	\$15,000
18	20%

20. List up to three priorities that could be addressed to increase employees training uptake in water industry operations qualifications. This could be internally or by industry and/or government)		
answer options	Response Percent	Response Count
1	100.00%	20
2	70.00%	14
3	55.00%	11
<i>answered question</i>		20
<i>skipped question</i>		17

Respondents	1	2	3
1	Pay Increase	Promotion	
2	better package of modules	training orientated to on the job with assessment	Pay reward for successful completion
3	More jobs in this area		

4	Practical, targeted courses	Additional funding	
5	increase basic level of operator education	establish internal training coordinator	increase incentives - make it worthwhile
6	Enough at present		
7	TAFE better organised		
8	Water Operators Cert	Fluoride Operators Cert	Plant Operations
9	eligibility for promotion, recognition or increased remuneration of new qualification	Course content covering entire industry rather than tradition water or wastewater treatment. Most RTO's have not yet started developing course materials for the new modules in the training package	
10	Remuneration	Budgeting/Funding	Recognition
11	on the job assessment	training courses held on site	recognition of prior learning
12	Further support	Identifying the need for upskilling staff	Better correspondence training
13	Government incentive funding for Local Government	More structured course by TAFE	Fluoride courses incorporated into the course
14	Government Subsidies for Organisations		

15	Routine industry skills training	Basic Electrical Training	Operator training - Water & Sewer
16	flexable delivery		
17	Unsure of these next questions		
18	Budget	Duration of training	Specific needs training
19	job security	better career paths	better pay rates
20	free (or heavily subsidised) training	local training	gross difference in reward for trained personel

21. With regard to water industry operations training what has NOT worked in the past?	
answer options	Response Count
	16
<i>answered question</i>	16
<i>skipped question</i>	21

Respondents	
1	Older employees who left school at an early age have very limited math skills.

2	<p>Poorly delivered on the job training,</p> <p>Traineeships as a means to get people off the dole,</p> <p>Attendance at training being the criteria for acquisition of skill competencies and lack of adequate assessment (Everyone gets a pass)</p> <p>failure to maintain a formal strong apprenticeship system.</p> <p>Failure to have a structured training college with a meaningful Water Certificate at completion like at Werribee in Victoria. (Perhaps this should be expanded beyond Victoria and develop a national certificate)</p>
3	<p>1. Intensive block release training.</p> <p>2. Self paced distance education training packages.</p>
4	<p>Some structured training that is often pitched at too high a level eg operators have recently completed a course on electrical awareness.</p>
5	<p>TAFE courses not as good as Public Works courses. TAFE disorganised in setting up current course structure. Public Works courses are very thorough but not modular enough for operators who have to cover operations/processes that are not relevant to them - would be good to do basic modules across the board and then specialise in relevant processes.</p>
6	<p>External advertising to pick up single certificate operators</p>
7	<p>RTO's have not invested in the development of new course materials that cover the "Industry". They have continued to use the same old traditional water and wastewater training notes.</p> <p>The course materials do not encompass new or emerging technology, they appear to be 10yrs or more out of date</p>
8	<p>sending people to DEUS raining courses where trainers are often difficult to understand and/or content is over the top for operational staff</p>
9	<p>In the past OTEN has not been successful but we are trying again this year.</p>

10	Training supplied by DEUs at an unusually high cost for a weekly course
11	TAFE RPL courses. These effectively just recognised what the employees had already learnt of the job and through attending DEUS training courses. The employees did not pick up any new skills or knowledge in these courses.
12	block release for study
13	Screen based training
14	Specific needs training
15	Employing staff with relatively low education levels, and sending such operators to short courses (eg. Dept of Water & Energy - Operator Training. High failure rates and costs to Council. In many cases Operators do not have the confidence or scholastic skills to successfully pass these courses.
16	?

22. With regard to water industry operations training what has worked in the past?	
answer options	Response Count
	18
<i>answered question</i>	18
<i>skipped question</i>	19

Respondents	
1	Hands on training more practical approach and less theory.
2	Refer to Water training centre at Werribee in Victoria They provide an excellent standard of training. DEUS courses for water and w/water at various country locations
3	DEUS operator schools tend to be very effective.

4	Supervised distance education training packages.
5	Most training has been beneficial to a certain degree. General - looking at the proposed Cert III Courses following, a number of them would be relevant although this may not have come out in the survey because they are performed by different staff than the examples.
6	Public Works/Commerce courses - very practical and relevant. Once organised TAFE has improved, with some components delivered on site.
7	Employees attending OTEN run operator courses and intensive one week operator upgrades or refreshers
8	Onsite delivery of training
9	On the job assessment and local training courses
10	TAFE Courses and Department of Commerce Courses
11	The Deus training has worked as they are aimed at operators
12	DEUS Water and Sewer Operator training courses over 5 day periods.
13	DEUS courses combined with on the job training with an experienced operator.
14	training specific to our equipment / process
15	Toolbox meetings
16	OHS training
17	Recruiting staff that have a reasonable level of education and ability to learn.
18	?

And finally, why has it worked?	
answer options	Response Count
	16
<i>answered question</i>	16
<i>skipped question</i>	21

Respondents	
1	The older employees feel more comfortable with this approach.
2	<p>Trainees have been motivated by acquiring a meaningful respected qualification.</p> <p>Employer's encouragement in attitude and support,</p> <p>Networking with other people in the industry,</p> <p>Instructors have provided experienced and knowable suggestions to operator's problems post training</p> <p>Very well respected practitioners talking the language of the trainees.</p>
3	The operators were fully supervised and required to complete modules in set time frames. This then reflected in pay increases through salary system.
4	Often because the training suits the needs.
5	Training has been thorough.
6	Council chose to support employee involvement with leave, tutoring and mentoring
7	It has provided a good link to practical work rather than just theoretical learning.
8	because the employee can be trained in his local context, show someone how they do things and then learn why, smaller classes, less travel, less time away from family and work
9	The Courses are based on industry requirements and is practical
10	Practical
11	Intensive course with other industry personnel where new skills and knowledge were learnt with formal exams and qualifications at the end if they passed.
12	They pick up the knowledge at the course and get a useful set of reference notes to refer back too when problems come up. Also the on the job training enables them to put into practice what they learn and also to associate what they are learning to the work they are performing - reinforcing the knowledge.
13	more personal, fewer attendees to trainers
14	a need there at work places to implement to work in a safe environment.

15	Usually, the better educated people have much more ambition, and are faster learners.
16	?

23. And finally, why has it worked?	
answer options	Response Count
	16
<i>answered question</i>	16
<i>skipped question</i>	21

Respondents	
1	The older employees feel more comfortable with this approach.
2	Trainees have been motivated by acquiring a meaningful respected qualification. Employer's encouragement in attitude and support, Networking with other people in the industry, Instructors have provided experienced and knowable suggestions to operator's problems post training Very well respected practitioners talking the language of the trainees.
3	The operators were fully supervised and required to complete modules in set time frames. This then reflected in pay increases through salary system.
4	Often because the training suits the needs.
5	Training has been thorough.
6	Council chose to support employee involvement with leave, tutoring and mentoring
7	It has provided a good link to practical work rather than just theoretical learning.
8	because the employee can be trained in his local context, show someone how they do things and then learn why, smaller classes, less travel, less time away from family and work
9	The Courses are based on industry requirements and is practical
10	Practical

11	Intensive course with other industry personnel where new skills and knowledge were learnt with formal exams and qualifications at the end if they passed.
12	They pick up the knowledge at the course and get a useful set of reference notes to refer back too when problems come up. Also the on the job training enables them to put into practice what they learn and also to associate what they are learning to the work they are performing - reinforcing the knowledge.
13	more personal, fewer attendees to trainers
14	a need there at work places to implement to work in a safe environment.
15	Usually, the better educated people have much more ambition, and are faster learners.
16	?

Appendix B - Invitation to participate

Dear Water Directorate Member

The NSW Utilities & Electrotechnology Industry Training Advisory Body (www.uensw.com.au) is conducting a research survey through the consulting group Mulga Gidgee. The NSW Department of Education and Training is funding the project.

Your response should take 30-45 minutes and will assist informing policy and program development for vocational training in the regional Local Water Utilities of NSW.

The National Water Industry Training Package currently includes Certificates I, II, III, IV and a Diploma in Water Industry Operations. <http://www.ntis.gov.au/Default.aspx?/trainingpackage/NWP01>

The package has been recently reviewed and is awaiting endorsement with some changes to reflect new vocational training policies and industry needs.

<http://www.governmentskills.com.au/content/view/198/401/>

Here is a link to the survey:

<http://www.surveymonkey.com/s.asp?A=191109813E71790>

Alternatively, please email anniemccall@optusnet.com.au to either request a word document version of the survey or to arrange a suitable telephone interview time.

Thank you for your participation

Kind regards

Annie McCall
(Mulga Gidgee)

Please note: If you do not wish to receive further emails from us, please click the link below, and you will be automatically removed from our mailing list.

<http://www.surveymonkey.com/r.asp?A=191109813E71790>

Appendix C- Research Survey

Skills Needs of Water Industry in NSW Research Survey

The NSW Utilities & Electrotechnology Industry Training Advisory Body is conducting this research survey through the consulting group Mulga Gidgee. The NSW Department of Education and Training is funding the project. The project aims to inform policy and program development for vocational training in the regional Local Water Utilities of NSW.

It is estimated that the survey would take 30-45 minutes to complete.

1. What is your name?
2. What is your position title?
3. In which water directorate region is your organisation? (please cross one)
 A Orana
 B South West
 C Central West
 D New England
 E North Coast
 F Mid North Coast
 G Hunter
 H Illawarra
 I South East
Other (please specify)
4. Your contact details (email, phone):
5. Did you know about the National Water Industry Training Package prior to receiving the email regarding this research? (Please cross)
Yes No
6. Please cross here if you want further information about the National Water Industry Training Package

The survey will now focus on rating the skills of different employee categories, in different operational areas, of the organisation identifying the:

- Current skills your organisation **has now**
- Current skills your organisation **needs now**
- Skills your organisation **needs to have in the future** (5-10 years) with the uptake of new technologies and the continuing impact of the drought.

Please select from the drop down menu (**No Skills, Basic Skills, Average Skills, Advanced Skills or Not Applicable**)

7. Please rate the skills in your organisation for **Assistant -Operator Employees** eg. Assistant Water Treatment Plant Operator

Operational Area	Assistant-Operator Employees		
	Has now	Needs Now	Needs to have in Future
	Water Treatment	No Skills	No Skills
Wastewater Treatment	No Skills	No Skills	No Skills
Operations & Maintenance	No Skills	No Skills	No Skills
Bulk Water & Catchment Management	No Skills	No Skills	No Skills
Engineering, Strategy & Assets	No Skills	No Skills	No Skills
Planning, Development & Environment	No Skills	No Skills	No Skills
Administration & Support	No Skills	No Skills	No Skills
OH&S	No Skills	No Skills	No Skills

8. Please rate the skills in your organisation for **Operator Employees** eg. Water Treatment Plant Operator

Operational Area	Operator Employees		
	Has now	Needs Now	Needs to have in Future
	Water Treatment	No Skills	No Skills
Wastewater Treatment	No Skills	No Skills	No Skills
Operations & Maintenance	No Skills	No Skills	No Skills
Bulk Water & Catchment Management	No Skills	No Skills	No Skills
Engineering, Strategy & Assets	No Skills	No Skills	No Skills

Disclaimer: The views expressed in this work do not necessarily represent the views of the NSW Department of Education and Training. NSW Department of Education and Training does not give warranty nor accept any liability in relation to the content of this work.

Planning, Development & Environment	No Skills	No Skills	No Skills
Administration & Support	No Skills	No Skills	No Skills
OH&S	No Skills	No Skills	No Skills

9. Please rate the skills in your organisation for **Co-ordinator Employees**
eg. Water Treatment Co-ordinator

Operational Area	Co-ordinator Employees		
	Has now	Needs Now	Needs to have in Future
Water Treatment	No Skills	No Skills	No Skills
Wastewater Treatment	No Skills	No Skills	No Skills
Operations & Maintenance	No Skills	No Skills	No Skills
Bulk Water & Catchment Management	No Skills	No Skills	No Skills
Engineering, Strategy & Assets	No Skills	No Skills	No Skills
Planning, Development & Environment	No Skills	No Skills	No Skills
Administration & Support	No Skills	No Skills	No Skills
OH&S	No Skills	No Skills	No Skills

10. Please rate the skills in your organisation for **Technologist or Specialist Employees** eg. Water Treatment Technologist, Water Quality Specialist

Operational Area	Technologist or Specialist Employees		
	Has now	Needs Now	Needs to have in Future
Water Treatment	No Skills	No Skills	No Skills
Wastewater Treatment	No Skills	No Skills	No Skills
Operations & Maintenance	No Skills	No Skills	No Skills
Bulk Water & Catchment Management	No Skills	No Skills	No Skills
Engineering, Strategy & Assets	No Skills	No Skills	No Skills
Planning, Development & Environment	No Skills	No Skills	No Skills
Administration &	No Skills	No Skills	No Skills

Support			
OH&S	No Skills	No Skills	No Skills

11. Please rate the skills in your organisation for **Degree Qualified Employees** eg. Process Engineer, Hydrologist

Operational Area	Degree Qualified Employees		
	Has now	Needs Now	Needs to have in Future
Water Treatment	No Skills	No Skills	No Skills
Wastewater Treatment	No Skills	No Skills	No Skills
Operations & Maintenance	No Skills	No Skills	No Skills
Bulk Water & Catchment Management	No Skills	No Skills	No Skills
Engineering, Strategy & Assets	No Skills	No Skills	No Skills
Planning, Development & Environment	No Skills	No Skills	No Skills
Administration & Support	No Skills	No Skills	No Skills
OH&S	No Skills	No Skills	No Skills

12. Are any of the following reasons relevant to the identification of the future skills gaps identified above? (Please cross if relevant)

- Ageing Workforce
- Organisational Structure
- Remuneration/Salary
- Competition from other industries
- Poaching of employees
- Lack of training and development
- Lack of career pathways
- Lack of recognition

13. Are there any other reasons or comments?

14. What skills and training and development programs does your organisation provide for employees? (Please cross all that apply)

- Structured training delivered at your site
- Structured training delivered offsite
- Structured training delivered electronically or remotely
- Structured on-the-job training
- Undergraduate or postgraduate university courses
- TAFE courses

- Seminars or conferences
- University Graduate recruitment and development program

TAFE Course Qualifications and/or Other programs (please specify)

15. What support does your organisation give to employees to participate in those skills and development programs above? (Please cross all that apply)

- Time off for lectures and/or study
- Full financial support
- Part-financial support
- Unsure

Other (please specify)

16. Please identify any barriers for employees taking up training and formal qualifications in your organisation (for example lack of career opportunities and/or mentors, budget constraints)

17. What is your organisation's budget allocated to water industry operations?

18. What is your organisation's budget allocated to training in total?

19. Do you know, or could you estimate approximately (amount or percentage), the amount allocated to water industry training in your organisation?

20. List up to three priorities that could be addressed to increase employees training uptake in water industry operations qualifications. This could be internally or by industry and/or government)

1.

2.

3.

21. With regard to water industry operations training what has **NOT** worked in the past?

22. With regard to water industry operations training what has worked in the past?

23. And finally, why has it worked?

Thank you for your time and input into this research survey. Please email it to anniemccall@optusnet.com.au

The NSW Utilities & Electrotechnology ITAB is currently developing training resources for the Certificate 3 units below. If you are interested in being involved please contact naomi@uensw.com.au

NWP301B-Implement, monitor and co-ordinate environmental procedures

NWP308B-Test and commission wastewater collection systems

NWP309B-Test and commission water distribution systems

NWP310B-Monitor and operate water distribution systems

NWP311B-Monitor and operate wastewater collection and transfer systems

NWP317B-Control water quality in distribution systems

NWP334B-Monitor and control maintenance of water distribution assets

NWP335B-Monitor and control maintenance of wastewater collection and transfer assets

NWP338B-Perform infiltration investigations

NWP339B-Perform leak detection