



State of Vermont
Feasibility Study for an
Agency of Agriculture Food and Markets/
Department of Environmental Conservation
Laboratory

January 2014
Project #13184.00

The **S / L / A / M** Collaborative

1. Executive Summary



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Background

In August, 2011, Winooski River floodwaters resulting from Tropical Storm Irene severely damaged the Vermont Agency of Agriculture Food and Markets (VAAFAM) and Vermont Department of Environmental Conservation (DEC) Laboratory in the Waterbury State Office Complex. Since that time, laboratory operations have been scattered among several temporary locations, most significantly at the Hills Building at the University of Vermont. Co-location of the two programs in the Hills Building is subject to a lease that expires in August, 2015 (with two options to extend the lease until August, 2017). Subsequently, as part of a comprehensive redevelopment plan for the Waterbury State Office Complex, the decision was made to demolish the VAAFAM-DEC laboratory building. No permanent future site has yet been identified for these programs.

Responding to the need for a long-term plan to replace the VAAFAM – DEC laboratory facility, this feasibility study was authorized and funded by the Vermont General Assembly pursuant to Act 51 of 2013, which directed VAAFAM and DEC, in consultation with the Department of Buildings and General Services (BGS), to “examine and report to the General Assembly on the feasibility of sharing the same laboratory, exploring relationships with the University of Vermont and the Vermont State Colleges system, or other public or private entities, and determining what specialized services may be sold within the Northeast region to fulfill state and regional laboratory needs ... [including] a cost-benefit analysis and a governance model.”

This study was designed to explore three options for replacing the VAAFAM and DEC lab functions lost following Tropical Storm Irene:

- **Option 1** is to **OUTSOURCE** essential laboratory testing to commercial laboratories and/or to public laboratories in other states.
- **Option 2** is to replicate the model that existed in the Waterbury facility as closely as possible, whereby the Agency of Agriculture and the Department of Environmental Conservation would be **CO-LOCATED** but maintain separate laboratory operations in the same facility.
- **Option 3** is to consolidate VAAFAM and DEC programs in a single **COLLABORATIVE** facility operated jointly by the two agencies under a new governance model, in order to maximize efficiency and eliminate duplication.

Laboratory Missions

The Vermont Statewide Strategic Plan articulates the following strategic priorities that are supported by the mission of the VAAFAM and DEC laboratories :

- “Promote programs, policies and legislation that support economic growth and competitive advantage for Vermont businesses and job creation in Vermont. Provide fair and consistent regulation of the marketplace.”
- “Protect, sustain and enhance conservation of our natural resources for the benefit of this and future generations and to enhance our quality of life.”
- “Maintain and enhance the health and productivity of farm and forest land, and wildlife habitats, including ecosystem services (flood resilience, water quality, clean air etc.)”
- “Establish a statewide crop and feed safety program that manages all aspects of agricultural commodity safety, including pathogens, pesticides and other potential contaminants.”

The VAAFAM and DEC laboratories provide a wide range of services to the people of Vermont, consistent with these priorities and the broad VAAFAM and DEC missions to protect human and animal health, safeguard environmental resources, and foster commerce and economic development. Lab services protect the integrity of iconic Vermont institutions such as the dairy and maple syrup industries, develop data that protect and support the long term vitality of important air, soil, and water resources, and extend into many other less visible areas of Vermont life.

While the daily services provided by the labs are critical to commercial activities and long term environmental protection, the labs’ ability to quickly and effectively respond to urgent health threats and emerging threats to natural resources is essential. Not only are major unanticipated situations a regular occurrence, but these situations by their nature cannot be planned for in advance. The capacity of the labs to respond quickly and nimbly is essential to the protection of consumers, and to the continuing viability of major Vermont industries such as dairy. Several ongoing or emergency situations addressed by the labs are highlighted below and more are included in **Appendix A**.

1. Protecting Human and Animal Health

- **Bedbug / Pesticide Misuse:** It was found that hundreds of residential units had potentially been treated with a bedbug

pesticide that had been banned for residential use. The Agriculture lab, the Department of Health Lab, and federal authorities worked closely together to obtain and test more than 1000 samples, and provide prompt feedback to concerned citizens.

- *Public Schools / Pesticide Misuse:* It was found that a pesticide to control head lice had been sprayed on a school carpet. The Agriculture lab was able to collect samples, analyze them, and send detailed results and risk analysis to parents within one day.
- *Contaminated Pet Food:* It was found that imported pet food was contaminated with melamine nationwide. The Agriculture lab was able to rapidly obtain and test pet food products locally, and then quickly advise state citizens of the specific risks in their local areas.
- *Mercury Contamination:* As part of a major study of mercury in the northeast, the DEC Lab was instrumental in the development of data describing sediment and fish tissue mercury concentrations from lakes in the Vermont-New Hampshire region, and contributing water chemistry measurements. The DEC laboratory work substantiated the need for Vermont's comprehensive mercury legislation, signed into law in 2005

2. Safeguarding Environmental Resources

- *Water Resources:* The LaRosa Analytical Services Grant is a partnership between some of Vermont's volunteer (citizen) watershed groups, the DEC Monitoring, Assessment and Planning Program, and the DEC Laboratory. The project began in 2003 and has since fostered partnerships with 31 associations and assessed over 800 sites throughout Vermont. This program is organized and coordinated so that volunteer sampling expands upon DEC staff sampling; effectively furthering a primary mission of DEC to protect, maintain, enhance and restore the quality of Vermont's surface water resources. The DEC Laboratory provides the analysis at no cost to the volunteer groups.
- *Air Pollutants:* In 2004, EPA established a National Air Toxics Trends Station (NATTS) monitoring network to fulfill the need for long-term air toxics monitoring data of consistent quality. The primary purpose of this 27-site national network of air toxics monitoring stations is tracking trends in ambient levels of air toxic pollutants that are associated with a wide variety of adverse health effects and regulated under the Clean Air Act. DEC's monitoring site in Underhill, Vermont is one of the NATTS sites and is considered a representative national "background" site. The DEC Laboratory provides air toxics analytical results such as volatile organic compounds, carbonyls, and metals to AQCD for this air monitoring.
- *Long-term Continuity and Consistency of Environmental Health Data:* Data comparability and quality are critical for long-term monitoring and decision-making. Vermont invests approximately \$500,000 annually in the Lake Champlain Monitoring program. Consistent use of DEC's laboratory for sample analysis ensures that this investment is based on credible data.

3. Fostering Commerce and Economic Development

- *Contaminated Produce / Commerce:* After Tropical Storm Irene, the federal Food and Drug Administration recommended that thousands of acres of animal feed be destroyed due to potential contamination. The Agriculture lab was able to test the feed and promptly confirm that it was safe to use, saving the crops and sparing farmers from further financial harm.
- *Maple / Food Safety:* Testing over several years has led to numerous improvements in maple industry practices, addressing food safety issues as well as contaminants affecting the flavor of the syrup.
- *Dairy:* The VAAFMM diagnostic laboratory handles the product and animal health testing for Vermont's dairy industry. At \$493,926,000 produced annually, the Vermont dairy industry is responsible for 73% of the total market value of agricultural products produced in the state. The lab's activities have enabled the number of on-farm processors to increase by more than 35% in the last five years, from 63 in 2008 to 97 in 2013.

4. Positioning the Lab for Growth and New Areas of Service

In the coming years, emerging health trends and new federal programs will require implementation and support from the VAAFMM and DEC laboratories, including :

- More stringent federal food safety rules
- Organic certification for growers
- Labeling and certification of genetically engineered foods and seeds
- Plant virus screening as it increasingly impacts interstate and international commerce

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- Increasing air toxics analysis

Options for Replacement of the VAAFM-DEC Laboratories

1. **Outsourcing:** Of the three primary options (Outsourced, Co-located and Collaborative) only the Co-located and Collaborative models appear to meet all of the needs identified by the State of Vermont. Specifically, the Outsourced model (Option 1) is not more cost effective than the other two options, nor does it appropriately address all issues related to quality and response time. **Section 3** of this report outlines in detail the potential for higher annual operating costs associated with outsourcing. Further, review of outsourcing efforts in other states reveals that core laboratory services can be outsourced with only marginal success.

Other concerns with the Outsourced model are that:

- It does not appear to handle well the need for research and analysis with respect to new services or growth in services.
 - For some tests, especially in the environmental field, few if any outside labs have the capability to detect the low levels of contaminants that the tests require.
 - It does not appear to be an effective model for urgent and emergency situations, where immediate and/or large scale response is needed. Unlike a state operated lab, it is not likely that an outside lab will be able to set all else aside in such a situation. Many of the incidents outlined above and in **Appendix A** would not have been effectively addressed and resolved under an outsourced lab model.
2. **Internal Options:** Option 2 (Co-located) and Option 3 (Collaborative) present two different models for a new state laboratory facility that would continue to deliver the lab services that were provided at the Waterbury facility, and are being provided, with some limitations, today. In considering these options, some key issues should be noted:
 - Several studies in the years prior to Tropical Storm Irene reviewed the operation of the labs and made recommendations for improvements, including consolidation. The most significant is the Association of Public Health Laboratories (APHL) report of 2006, which is included as **Appendix B** to this report. The recommendations were generally not implemented at the time, in part due to the limitations of the Waterbury facility, but remain valid.
 - Current lab operations lack full time, dedicated position for safety, waste management, and quality control. The labs are currently relying on their University of Vermont landlord for some of these services. Option 2 and Option 3 both address this need.
 - Option 3 can restore all lab functionality that existed prior to Tropical Storm Irene, accommodate some growth, and provide proper oversight for safety, waste management, and quality control, all without adding to the current number of full time staff positions approved for the lab. Option 2 requires the addition of 3.5 full time staff positions to accomplish this.
 - The size of the facility required to support Option 2 would be approximately 10 percent larger than the facility that would be required for Option 3.
 - Either option could include all of the lab programs that existed in the Waterbury facility. To evaluate the impact of including or excluding some programs from the facility, all programs were classified as either Tier 1, Tier 2, or Tier 3, as follows:
 - ◇ The Tier 1 programs are the analytical labs that are essential to the new facility, and would be included in the new lab governance model proposed for Option 3.
 - ◇ The Tier 3 and some Tier 2 programs could be located elsewhere if necessary, in order to reduce the capital investment in the new facility. The annual operating costs incurred would, however, be greater in many cases.
 - ◇ The Weights and Measures program, which is classified as Tier 3, is the only program adequately housed at the present time.
- Please refer to the cost matrix on page 8 and to **Section 4** of this report for additional information.
- While it is not the intent of this study to make a final, specific site recommendation, several preliminary locations have been considered during the preparation of this study: a new site near Montpelier, a site on or near the University of

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Vermont campus or the Vermont Technical College campus, and a site in Colchester adjacent to the new Department of Health lab. The potential synergies to co-locate and/or collaborate with the Department of Health at the Colchester site are numerous, but the site itself presents challenges.

- **The state's lease at the University of Vermont expires in August, 2015, with two one year options. In order to have a new facility ready for occupancy by August, 2017 at the latest, a site needs to be selected and design work needs to begin by late 2014. Please also refer to the schedule in Section 5.**

The Co-located model (Option 2) does adequately address all of the above issues and would be a responsible solution for the State of Vermont. It would be the easiest to implement of the three options because it would essentially be "business as usual" with a new facility modeled after the one in Waterbury that was lost. However, programmatically it would suffer from the same functional weakness of redundant services between VAAFM and DEC. In addition, it could only marginally implement the recommendations of the 2006 APHL study for improved operations.

Recommended Option

The Collaborative model (Option 3) is the best choice overall for improved lab functionality, capacity for growth, efficient cost of construction, and reduced operational cost. A significant benefit of such a solution would be the ability to implement proven production workflow enhancements commonly referred to as "Lean Production Management". The one significant challenge with Option 3 is that a major change in governance will be required for it to be successful. However, representatives from VAAFM and DEC have consistently expressed their willingness to treat this challenge as an opportunity for improved collaboration and delivery of services. It is assumed that this willingness will continue and develop further as a program for construction of a new lab continues.

Thus, the significant benefits of a Collaborative Lab model (Option 3) are:

- Reduced cost of construction by approximately \$1.7 million, compared to the Co-located model. The anticipated cost for the facility is \$14.4 million before escalation and allowances for unforeseen conditions. Assuming construction starting in 2016, the total budget inclusive of these allowances would be \$18.1 million, as outlined in **Section 5** of this report.
- Reduced cost of facility operation, compared to the Co-located model.
- Reduced staffing costs by approximately \$250,000 per year, as compared to the Co-located model.
- Reduced "fee for space" for facility charges by the Vermont Department of Buildings and General Services of roughly \$30,000 per year as compared to the Co-located model.
- Best use of space for current needs and future growth.
- Best operational management of work flow and demand to manage growth and peak/emergency situations.
- Most flexibility to adapt to new developments such as growth and changes in testing requirements, and evolving partnerships with neighboring states and with institutions within Vermont. Potential partnerships with other states, with the Department of Health, and with the University of Vermont or Vermont Technical College can be studied further as planning continues.
- Opportunity to implement "Lean Production Management" techniques for streamlined governance, emergency response, delivery of analytical services, and data delivery.
- Opportunity to efficiently implement all recommendations of the 2006 APHL study.
- Alignment with strategic initiatives of the State of Vermont for the delivery of services.
- Enhanced perception of "best use of resources" on the part of VAAFM and DEC from the viewpoint of the citizens of Vermont.
- No significant increase in operational budgets to VAAFM and DEC as the new facility goes into operation.
- All lab functions that existed prior to Tropical Storm Irene can be restored without adding any staff positions.

The loss of the Waterbury lab has produced the opportunity to reimagine the laboratory with a clean slate, no longer constrained by the limited adaptability of that facility. Of the available options, the proposed collaborative laboratory facility makes the best use of that opportunity.

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Recommendations to the Vermont General Assembly, VAAFM, DEC, and BGS

1. Build a new Collaborative Laboratory (Option 3) for VAAFM and DEC in which all lab functions are aligned based on scientific discipline and method instead of by departmental customer. Include all proposed lab functions in the new facility.
 - Provide funding for and immediately begin a process to determine the preferred location and design for the new facility, and to then select and obtain the rights to a specific site. The site for the new facility should be confirmed no later than the end of 2014 (see schedule in **Section 5**, page 57). Funding should, at a minimum, provide for site selection, site acquisition, design and planning costs.
 - As part of the site selection process, develop an order of priority among the key factors affecting the decision: proximity to Montpelier, access to BSL-3 space, future collaboration with the Department of Health, and the potential of a higher education partnership.
 - Design the new facility for flexibility and growth, so that the core analytical labs can grow into space occupied by the other labs if necessary, and to facilitate changing priorities as state and regional partnerships evolve. Plan for anticipated growth in testing, including areas such as food safety, organic agriculture, GE seed testing, and air toxics analysis.
 - Please also refer to the table on page 8 for a brief overview of the proposed Collaborative Laboratory, and the implications of several alternative scenarios.
2. Develop a collaborative governance model for a consolidated and jointly operated laboratory that appropriately shares authority, responsibility, cost and benefits between VAAFM and DEC. If not feasible due to legal constraints on the agencies, then shift all lab personnel to either VAAFM or DEC and implement an appropriate governance model. Implementation of this new model need not wait until the new laboratory facility is complete; in fact, it should be implemented at the earliest reasonable opportunity.
 - With the introduction of the new governance model, implement coordinated plans for laboratory safety, laboratory waste management, and laboratory quality assurance.
 - Implement a LIMS (Laboratory Information Management System) throughout the lab (DEC is already using LIMS, but VAAFM needs to bring LIMS online).
3. Both as the project develops and after the new facility is complete, continue to explore and upgrade partnerships with labs in other states, and with institutions in Vermont, to develop areas of leadership and specialized expertise in each location.
4. Implement, at a minimum, all major recommendations of the 2006 APHL Study (see **Appendix B**, page 75).

NEW VAAFM-DEC LABORATORY OPTIONS

FACILITY DESCRIPTION	Personnel in the Proposed Building	Capital Cost for New Building (Budget)	Cost Per Year to VAAFM / DEC vs. Recommended Option	Average Annual Debt Service (Payable by BGS) see Notes 3 & 10	Annual Cost for Berlin Space (Payable by BGS)	Other Notes
RECOMMENDED OPTION						
New Collaborative Lab Facility Incorporating All Lab Programs (36,375 square feet)	15 Analytical Lab staff, 22 other staff, 37 total	\$14.4 to \$18.1 million	N/A	\$1,020,000 to \$1,290,000	None	

ALTERNATIVES

						The cost of lost ability to provide services and lost responsiveness is not accounted for. Also see Note 9
No New Facility - Outsourcing	N/A	N/A	+ \$592,000	N/A	None	
New Co-located Lab Facility Incorporating All Lab Programs (39,083 square feet)	18.5 Analytical Lab staff, 22 other staff, 40.5 total	\$16.1 to \$19.8 million	+ \$573,000	\$1,150,000 to \$1,410,000	None	
New Collaborative Lab Facility Incorporating All Lab Programs Except Weights & Measures (33,225 square feet)	15 Analytical Lab staff, 21 other staff, 36 total	\$13.8 to \$17.3 million	Negligible difference in cost anticipated	\$980,000 to \$1,230,000	estimated \$21,000 in first year	Assumes that Weights & Measures can remain in Berlin. See Notes 4 - 6
New Collaborative Lab Facility Incorporating All Lab Programs Except Weights & Measures and Air Quality (31,275 square feet)	15 Analytical Lab staff, 19 other staff, 34 total	\$13.1 to \$16.4 million	See Note 8	\$930,000 to \$1,170,000	estimated \$37,000 in first year	Assumes that Weights & Measures and Air Quality can remain in Berlin. See Notes 4 - 8

NOTES:

- Personnel count is inclusive of full time and temporary staff.
- Proposed capital budget for the new building is inclusive of construction cost, design fees, contingencies, etc. as outlined in Section 5.
- Debt service is based on a 20 year bond at an annual rate of 4.125% (current market rate).
- Berlin cost is based on a 5 year lease proposal from the landlord and will increase by 2.5% per year starting in the second year
- Berlin cost is based on the prorated cost for the part of the building occupied by the programs. The entire building must be leased - estimated total cost is \$67,200 annually in the first year.
- Savings compared to the recommended option is negligible. Total cost to the State would be greater if no other program occupies the remainder of the Berlin building to share the cost.
- If Air Quality remains in Berlin, additional capital expenditures will be required to improve the space. That cost has not been estimated at this time.
- Additional cost will be incurred to transport Air Quality samples from Berlin to the analytical lab but that cost cannot be readily quantified.
- The additional cost to the agencies for outsourcing can be expected to increase annually at the rate of inflation plus growth.
- If the capital cost is partially reimbursed by FEMA, debt service would be reduced accordingly.