Washington State's Lean and Green Assistance Program Summary and Final Workplan 11-3-2009

Project Title: Lean and Green Assistance, FY 2010-2012 State Innovations Grant

Project Applicant: Washington State Department of Ecology (Ecology)

State Project Manager: Hugh O'Neill, Lean and Green Assistance Project Supervisor, 360-407-6354; hone461@ecy.wa.gov; Mailing Address: P.O. Box 47775, Olympia, Washington 98504-7775; Fax: 360-407-6305.

Total Project Cost: The State of Washington requests up to $240,000 of federal funds to support the continued development and implementation of the "Lean and Green Assistance Program." The federal funds will be leveraged with an anticipated $80,000 of state for a total project cost of $320,000. These amounts do not include the in-kind value of labor and expertise contributed by the Ecology's private-sector, non-profit-sector, university, and government partners.

Project Period: The period covered by this pre-proposal is 10/01/2009 – 09/30/2012.

Project Abstract: This proposal requests federal funding to develop and implement a lean manufacturing and environmental technical assistance program (called "Lean and Green Assistance") to improve environmental and operational performance for industrial and commercial entities. The goal is to build on our successful Lean and Environment Pilot Projects,[1] Green Suppliers Network (GSN) "Lean and Clean" projects and other project experiences and create an on-going, self-sustaining "Lean and Green" service that produces measurable environmental and business-operational results. Integrated lean and environmental technical assistance offers a compelling way to deliver significant, sustainable environmental results, improve operational efficiency, and foster a continual improvement culture focused on eliminating waste. Program activities will include conducting lean and green program development; training; marketing and recruitment of facilities; testing and refining lean and environment integration approaches; integrated, site-specific lean and environment service delivery; and measurement, documentation, and dissemination of results.

Statutory Authority and Flexibility: Ecology is the lead environmental agency for the State of Washington, having statutory authority for the Clean Air Act, Clean Water Act, and Resource Conservation and Recovery Act and federal funding through a Performance Partnership Agreement (PPA). Ecology has state authority to provide pollution prevention and waste reduction assistance (see Chapter 70.95C of the Revised Code of Washington [RCW]). This project is authorized through Ecology's "Beyond Waste" Plan (the agency's 30-year solid and hazardous waste state plan) which is required under RCW Chapters 70.105 and 70.95.

State Agency Support: Executive management supports the pre-proposal, including Director Jay Manning and K Seiler, Program Manager of the Hazardous Waste and Toxics Reduction Program. A letter of endorsement is attached, dated June 19th, 2009 from Ecology Director, Jay Manning.

[1] The results and lessons learned from the initial lean and environment pilot projects are summarized in the Washington Lean and Environment Project Final Report, available at www.ecy.wa.gov/programs/hwtr/lean.

Application Budget Summary 7-6-09

State: Washington State
Agency: Department of Ecology
Project Title: Lean and Green Assistance

Washington State Department of Ecology Lean and Green Washington Budget Detail

Line Item	Detailed Description	EPA Funds	Match Funds	Total
Personnel	EE3 @ .90 FTE total over 3 years ES4 @ .85 FTE total over 3 years	$87,150	$29,050	**$116,200**
Fringe Benefits	Health insurance, dental, etc. = 28.2% of salaries	$24,580	$8,190	**$32,770**
Travel	Travel - standard cost = $1,885/1.0 FTE per year plus an additional $11,000 for travel to generate interest with manufacturing organizations and other state governments.	$10,125	$3,375	**$13,500**
Equipment	Software or other tools to help track and measure results[2]	$7,500	$2,500	**$10,000**
Supplies	Supplies – standard cost = $1,538/1.0 FTE per year	$2,025	$675	**$2,700**
Contractual	• $60,000 for contracting assistance for the lean manufacturing event facilitation; • $30,000 for contracting assistance for measurement, report preparation, and third party assessment of the Program results.	$67,500	$22,500	**$90,000**
Other	Office needs (postage, phone, fax, etc.)	$0	$0	**$0**
Total Direct Charges		$198,880	$66,300	**$265,180**
Indirect Charges	36.8% of Personnel salary and benefits (rate approved by EPA May 2009)	$41,120	$13,700	**$54,820**
Grand Total		$240,000	$80,000	**$320,000**[3]

[2] This estimate is based on conversations with and a software demonstration recommended by Dave DeLarco, EPA Region X.
[3] This amount does not include the contribution from participating facilities to support on-site services (e.g. WMS fees).

Lean and Green Washington: Project Narrative

Problem Statement

The Washington State Department of Ecology (Ecology) is proposing a lean manufacturing and environmental technical assistance demonstration program—hereafter called "Lean and Green Assistance Program"—to improve environmental and operational performance of industrial and commercial entities. Three recent lean and green pilot projects saved businesses over $1.5 million, reduced pollution by over 800,000 pounds, and avoided 2 major permits. Through this proposal, Ecology and its service-delivery partners[4] will provide lean and green assistance to businesses to increase value and reduce wastes—including toxic chemicals, air emissions, wastewater, and energy—while also building the foundation for a self-sustaining, efficient, and effective Lean and Green Assistance Program that could serve as a model for efforts in other states.

There are hundreds of commercial and industrial facilities in Washington State that could potentially benefit from lean and green services; however, Ecology does not yet have a self-sufficient program for delivering lean and green services with its service-delivery partners. While successful, the initial Lean and Environment Pilot Projects were resource intensive (e.g., they involved additional time for Ecology staff training). There is a need to develop more streamlined, targeted models for lean and green service delivery. Currently, Ecology does not have the resources to identify and work with all businesses that would benefit from Lean services, even using more streamlined approaches. Small to medium-sized businesses often lack the resources to undertake lean and green projects by themselves. Finally, there is insufficient awareness among facilities about the business value of lean and green, and how Ecology's services could create more value for customers with less wastes and emissions.

Ecology's proposed Lean and Green Assistance Program will build on our very successful Lean and Environment Pilot Projects[5] and other recent lean and environmental technical assistance projects, including projects involving EPA's Green Suppliers Network (GSN) Program and university-based energy-efficiency programs. The Lean and Green Assistance Program will continue to be implementation-based and will produce and measure actual environmental and business results (not just estimates of potential results). Particular emphasis will be placed on:

- Developing a vigorous marketing campaign and defining the "value proposition" for lean and green that would be the most compelling to candidate facilities;
- Exploring how facilities could use lean methods to improve compliance and avoid the need for additional regulatory obligations (e.g. such as unnecessary permits or approvals);
- Targeting Ecology's involvement in lean activities strategically -- based on the:
  - Potential for environmental and operational improvement and
  - Likelihood for effective facility implementation;
- Developing streamlined models and "standard work" for lean and green service delivery; and
- Documenting lessons learned for lean and environmental service providers and potential

[4] Washington Manufacturing Services (WMS), Washington State University and University of Washington Energy Offices, Pollution prevention Resource Center, and Ross & Associates Environmental Consulting.
[5] See: http://www.ecy.wa.gov/pubs/0704033.pdf .

enhancements to EPA's Lean toolkits based on implementation experience.

Background

Ecology, Washington Manufacturing Services (WMS, a NIST Manufacturing Extension Partnership center), and other partners conducted three Lean and Environment Pilot Projects in 2006–08. These projects confirmed EPA's research findings that environmental considerations and tools can be effectively integrated into lean methods to reduce wastes, improve operational efficiency, and support continual improvement efforts at facilities. During the pilots, Ecology and WMS jointly delivered lean and green services to three manufacturing facilities in Washington State. These projects included lean and environment training, value stream mapping events to identify improvement opportunities, and several kaizen events to implement process changes and measure the results. This effort won a Most Valuable Pollution Prevention (MVP2) Award in 2007, and resulted in considerable cost savings and environmental results.[6]

Ecology's participation in lean and green projects is particularly valuable in that it:

- Engages directly with facility operations managers on high-priority improvement projects;
- Builds the capacity of facility staff for future environmental improvements (helping staff to "learn to see" environmental wastes as a part of lean and operational efficiency efforts);
- Establishes positive working relationships between operational and environmental managers at facilities and between the facility and Ecology; and
- Facilitates rapid implementation and adoption of techniques that reduce wastes, make facilities more competitive, and improve environmental results.

The Lean and Green Assistance Program will use the lessons learned from the initial pilot projects, other recent lean and green projects, and EPA's Lean Toolkits to support the "next generation" of demonstration projects. Specifically, streamlined and strategic lean and green projects that will allow Ecology and its partners to develop a framework for a self-sustaining, efficient, and effective lean and environmental technical assistance program. It is anticipated that these demonstration projects and the associated program infrastructure (e.g., marketing efforts, criteria for selecting candidate facilities and/or processes, etc.) will be more readily scalable and transferable than were the initial pilot projects. Ecology will document and share the results from the new lean and green projects, as well as identify potential enhancements to EPA's Lean publications, to facilitate the knowledge transfer to other environmental agencies, NIST MEP centers, and other lean and environmental technical assistance providers.

Program Guidelines and Eligibility Requirements.

The Lean and Green Assistance Program supports EPA's *Strategic Plan*, including Goal 5: Compliance and Environmental Stewardship, including Sub-objective 5.2.1, 5.2.2, and 5.2.3 with an emphasis on pollution prevention, sustainability and business assistance. Ecology's multi-media approach address all five goals included in EPA's Strategic Plan. Specifically, Ecology meets the "Threshold Criteria" as a "demonstration" and "public education program" as envisioned by the Solid Waste Disposal Act, 42 U.S.C. §6981(a)(3) and (a)(5). Multi-media aspects are incorporated into the Lean and Green Assistance Program, including:

[6] The results are presented in the Washington Lean and Environment Project Final Report, available at www.ecy.wa.gov/programs/hwtr/lean.

- Using lean and green assistance to improve compliance and multi-media environmental performance (e.g. the pilot projects achieved reductions in air and water pollution, solid and hazardous wastes, toxic chemical use and emissions, and energy use)
- Encouraging lean and green implementation as a path to reduce multi-media permitting and other regulatory requirements, and
- Developing methods that encourage participant facilities to incorporate sustainability into their operations.

Objectives (also see the Problem Statement section above)

1. Improve the partnerships with WMS, PPRC, WSU, UW, Ross & Associates, business and trade associations, and other key stakeholders.
2. Maximize the quality and effectiveness of lean and green services provided to customers.
3. Effectively adapt our services to meet the changing needs of our key customers.
4. Improve the efficiency of services provided.
5. Recruit, sign-up, complete, measure results, and document at least 3-4 lean and green projects per year for 3 years.
6. Maximize the operational, environmental, and energy efficiency results of the demonstration projects for participating facilities and the public.
7. Learn from our successes and mistakes and incorporate these lessons into our projects and program.
8. Help facilities identify and address their current and future environmental compliance and permitting requirements. This would mean:
    a. Identifying the compliance and permit requirements associated with the process changes planned during the current and future state value stream mapping events;
    b. During lean and green implementation (e.g., kaizen events), reducing the environmental impacts sufficiently to avoid triggering compliance violations or permit thresholds. (For instance, at Canyon Creek Cabinets, the company's vendors and our Lean and Environment Team reduced the VOCs from the staining process and thus avoided, for at least several years, the necessity of getting a Title V Air Operating Permit.)

Technical Approach

Need for Project, Tasks and Activities: This pre-proposal requests $240,000 in federal funds and adds to this $80,000 in state matching funds, for a total of $320,000. These funds will support the Washington Lean and Green Assistance Program, including roughly:

- $85,000 for funding a portion of an Environmental Specialist position to support program development tasks, including materials coordination, other related project implementation activities
- $135,000 for funding a portion of an Environmental Engineer position in an Ecology regional office to recruit and complete lean and green projects at participating facilities
- $10,000 for software or other equipment to help track and measure project results.
- $60,000 for contracting assistance for the lean manufacturing event facilitation
- $30,000 for contracting assistance for measurement, report preparation, and third party assessment of the Program results.

Ecology will be allocating at least 1.5 existing FTEs to leverage federal funds to support the Lean and Green Assistance Program.

The ratio of funding allocated for Ecology staff to funding for contracts may be contingent on effective marketing and sales -- meeting our goal of signing up an average of one facility project per quarter. The pilot projects were subsidized at a rate of 80% in a better economic period than present. EPA's GSN program has recently raised its rates and eliminated its subsidies and so may not be a significant source of candidates. If project demand does not meet our goal for one project per quarter, then Ecology may shift funds from staff to funds for project contracts or develop other incentives for facility participation. Depending on the amount of the fund shift, this may require Ecology to submit a formal grant amendment to EPA for approval. Ecology and partners are pursuing other supplemental funding (such as federal energy stimulus dollars) that may be used as an incentive for facility participation (e.g. to provide additional contract funding to defray facility costs).

The following tasks are anticipated:

Task 1. Lean and Green Assistance Program Development

Under this task Ecology will work with WMS, the energy programs at the University of Washington (UW) and Washington State University (WSU), the Pacific Northwest Pollution Prevention Resource Center (PPRC), Ross & Associates Environmental Consulting (Ross), and other partners to establish the framework for a self-sustaining lean and green service that produces measurable environmental and business-operational results. This will include:

- Establishing clear protocols and a streamlined communication infrastructure for identifying candidate facilities for projects and referrals,
- Training Ecology and WMS staff that have not yet been involved in delivering lean and green services, and
- Developing a work plan for conducting at least 3-4 demonstration projects per year (Task 2) along with providing suggestions for improving EPA's Lean Toolkits (Task 3) and conducting presentations and other outreach (Task 4).

We plan to incorporate continuous improvement approaches and tools into our program and service.

Task 1.1 Establish a Lean and Green Assistance Team (made up of Ecology, WMS, PPRC, Ross, EPA Region 10, and selected other partners) to:

- Refine the program goals and specific objectives,
- Develop a Workplan and Quality Assurance Project Plan (QAPP),
- Establish a streamlined system for communications and coordination among the lean and green service provider partners,
- Develop a marketing plan
- Review and update marketing, sales support, and recruitment materials,
- Establish data measurement needs, and
- Develop a training plan for Ecology and WMS field staff.

Start: 10/01/09; End: 03/30/10

Task 1.2 Coordinate with our established, local network of service provision partners, including WMS, WSU, and UW, to provide the services and expertise to meet the

specific needs of the facilities and specific projects identified. *Start: 10/01/09; End 09/30/12.*

Task 1.3 Conduct lean and green staff field training for Ecology, WMS, and/or other partners, as necessary. Include sales and on-site tools training. Include and go beyond the material in EPA's Lean and Environment Toolkit and Lean and Energy Toolkit. *Start: 01/01/10; End: 05/30/11*

Task 1.4 Conduct at least one (1) lean and environment technical training workshop or presentation for Local Source Control Partnership staff (described further under "collaboration" below) and/or other technical assistance staff at local governments. *Start: 01/01/10; End: 09/30/11*

Task 2. Lean and Green Demonstration Projects

Demonstration projects are the core of the Washington Lean and Green Assistance Program. Under this task, Ecology will contract with a lean provider such as WMS to facilitate lean and green events at 9-12 small-to-medium-sized enterprises (an average of 3-4 projects per year). On-site technical assistance will include lean and environment training, value stream mapping events, and kaizen or other lean implementation events. Ecology staff will work with WMS and the facilities to ensure that environmental wastes are identified and addressed throughout the projects. Projects may be coordinated or integrated with Washington State Job Skills Program Grants[7]. This task also includes marketing and sales activities to identify candidate facilities and the development of case studies documenting the results of the projects. Ecology technical assistance staff will work closely with WMS project managers to market and deliver our lean and green services. Nigel Moore, WMS COO, will continue to oversee the WMS lean and green activities.

Task 2.1 Identify a lean and green potential candidate facilities and sectors list to target marketing and recruitment efforts (consider EPA's focus areas from the Lean and Environment Initiative). Refine the candidate facility recruitment and selection criteria from the initial Lean and Environment Pilot Projects, as needed. *Start: 10/01/09; End 03/30/12*

Task 2.2 Develop an effective marketing plan and materials including articulating the "value proposition" for lean and green (coordinating with Ecology's TREE Team – see www.ecy.wa.gov/programs/hwtr/tree). Describe the Lean and Green service in positive, compelling financial terms. Revise the plan and materials as necessary to meet changing conditions and facility needs. Create a "pipeline" of candidate facilities large enough to support steady, long-term program implementation. *Start: 10/01/09; End: 9/30/12*

Task 2.3 Initiate marketing and recruitment activities. *Start: 9/01/09; End: 9/30/12*

Task 2.4 Conduct recruitment activities and joint Ecology/WMS "sales calls" and on-site meetings with targeted candidate facilities/companies/organizations. Provide marketing and sales support, materials, and training to field staff, as necessary. *Start: 10/01/09; End: 9/30/12*

Task 2.5 Identify sector, regulatory, or economic incentives and encourage entities to participate in lean and green projects. Market our services to selected facilities, trade associations, business groups (Association of Washington Businesses, Independent Business Association, etc.), and professional societies (e.g., Society

[7] http://www.sbctc.ctc.edu/college/_e-wkforcejobskillsprogram.aspx

for Manufacturing Engineers, Association for Manufacturing Excellence, and American Society for Quality local chapters). Start*: 10/01/09; End 09/30/2012*

Task 2.6 Work with WMS and participating facilities to develop a scope of work for each lean and green demonstration project. Manage and conduct on-site lean and green services. The following list of activities will be completed at each facility:

1. Lean Manufacturing and Environment Training for at least 15 people, if needed, for organizations that are just beginning their lean journey.
2. One day lean and green assessment on the facility's operations so that opportunities can be assessed. Based on the assessment a recommendation for a full assessment and implementation plan will be created. (optional)
3. A 3-4 day Value Stream Mapping event[8] examining the current facility situation (in a current state map) and developing the vision of desired improvements (a future state map and/or a detailed implementation plan), including the identification of environmental wastes and costs.
4. One to three or more kaizen events[9] or other implementation. These may involve other process improvement tools, such as 5S, six sigma, TPM, 3P, etc.
5. Application of the specific concepts, strategies, tools, and lessons in EPA's "Lean and Environment Toolkit," "Lean and Energy Toolkit," and forthcoming "Lean and Chemicals Toolkit" and "Lean and Six Sigma Guide for Environmental Professionals," as well as other promising tools available from the external Lean Community (for example, Value Stream Mapping software).
6. Measurement of the results of the project compared to the baseline. This normally happens 6-12 months after the last lean or implementation event.

Start: 10/01/09; End 09/30/2012

Task 2.7 Develop a short case study (See PPRC's "Woodfold case study" http://www.pprc.org/solutions/woodfoldcasestudy_12_07.pdf as an example) for each lean and green demonstration project documenting project activities and both operational and environmental performance results from each project. Post the case studies on Ecology's Lean website. *Start: 10/01/09; End 09/30/2012*

Task 3. Evaluation Memorandum

Under this task, Ecology and its partner will develop a memorandum summarizing potential enhancements or additions to EPA's Lean Toolkits and other publications based on the experiences and results of the Lean and Green Assistance Program. Particular emphasis will be placed on recommendations that could be relevant to the transferability of the Lean and Green

[8] **Value stream mapping** is used to assist supervisors and the cross-functional team(s) in creating a visual map of where the facility is (current state), and the development of a picture of where they want to be (future state). Value stream mapping not only shows where to eliminate or reduce waste, but also quantifies the potential results of the efforts. It also shows how to recognize bottlenecks and waste, and how to measure the "before" and "after" state of the Lean efforts of the facility.

[9] **Kaizen** is a rapid method for making process improvements in a focused area of a company. These events usually take place over a five-day period with a cross-functional team from the company.

Assistance Program model to other states or regions.

Task 3.1 Evaluate overall Lean and Green Assistance Program results and make recommendations for future improvements. In a technical memorandum, provide specific suggestions to EPA for enhancing and/or adding to EPA's Lean and Environment Toolkit, Lean and Energy Toolkit, and other Lean publications (e.g., the Lean Guide for Environmental Professionals currently under development).
Start: 06/01/2011 End: 09/30/2012

Task 4. Outreach

As with the initial Lean and Environment Pilot Projects, Ecology, WMS, and other partners will share information about the results and experiences of lean and green projects through Ecology's website; presentations at national, state, and local conferences and meetings reaching lean and environmental audiences in government and industry; and webinars or other workshops focused specifically on lean and green efforts.

Task 4.1 Maintain and update Ecology's Lean and Environment Website incorporating project case studies and results as they become available.
Start: 10/01/2009; End 09/30/2012

Task 4.2 Conduct at least two lean and green workshops or webinars with our partners. Invitees will include: businesses, trade associations, local governments, and other stakeholders to understand the potential benefits and disseminate project results.
Start: 02/01/2010; End 09/30/2012

Task 4.3 Develop and distribute press releases to local media on project results for each facility.
Start: 10/01/2010 (or when first project results are available); End 09/30/2012

Task 4.4 Develop and present presentations on the project scope, methods, and results, principally focused on the business and environmental communities.
Start: 10/01/201; End 09/30/2012

Task 4.5 As we are able (due to out-of-state travel policies) participate in the national EPA Innovations forum and national P2 and MEP events to share results on the Washington State Lean and Green Assistance Program model and lessons learned.
Start: 10/01/2009 End: 09/30/2012

Timeline:

Table 1. Timeline of SIG Lean and Green Tasks

	Start Date	Due Date
SIG Application Package to EPA	6/8/2009	7/16/2009
Final QAPP submitted to EPA	7/16/2009	9/14/2009
Task 2.3	9/1/2009	9/30/2012
Task 1.1	10/1/2009	3/30/2010
Task 1.2	10/1/2009	9/30/2012
Task 2.1	10/1/2009	3/30/2012
Task 2.2	10/1/2009	9/30/2012
Task 2.4	10/1/2009	9/30/2012
Task 2.5	10/1/2009	9/30/2012
Task 2.6	10/1/2009	9/30/2012
Task 2.7	10/1/2009	9/30/2012
Task 4.1	10/1/2009	9/30/2012
Task 4.3	10/1/2009	9/30/2012
Task 4.5	10/1/2009	9/30/2012
Quarterly Report 1	11/30/2009	12/30/2009
Task 1.3	1/1/2010	5/30/2011
Task 1.4	1/1/2010	9/30/2011
Task 4.2	2/1/2010	9/30/2012
Quarterly Report 2	2/28/2010	3/30/2010
Quarterly Report 3	5/29/2010	6/28/2010
Quarterly Report 4	8/27/2010	9/26/2010
Quarterly Report 5	11/25/2010	12/25/2010
Quarterly Report 6	2/23/2011	3/25/2011
Quarterly Report 7	5/24/2011	6/23/2011
Task 3.1	6/1/2011	9/30/2012
Quarterly Report 8	8/22/2011	9/21/2011
Task 4.4	10/1/2011	9/30/2012
Quarterly Report 9	11/20/2011	12/20/2011
Quarterly Report 10	2/18/2012	3/19/2012

Collaborations and Partnerships: Ecology has already established a lean and green service provider partnerships with WMS, PPRC, and Ross, and energy partnerships with WSU and UW. (Letters of Support from WMS and PPRC are available.) Collaboration with "in-house" lean facilitators at facilities or private lean service providers will be welcomed and encouraged. Outreach to other potential allies including:

- Climate Solutions – business partnerships (Ross McFarland)
- Prosperity Partnership (Bob Drewel)
- NBIS (Carl Ostrom)

- Bainbridge Graduate Institute Sustainable MBA Program
- Northwest Manufacturers Association (Grant Gilmore)
- Trade associations of targeted industry sectors, such as:
  - Northwest Food Processors Association
- Interested environmental NGOs, such as:
  - Washington Toxics Coalition
  - Washington Environmental Council

The Lean and Green Assistance Program will coordinate with and support other environmental efforts, including Ecology's Preventing Toxics Threats, Climate Change, and Puget Sound initiatives. A particular effort will be made to introduce staff at the 14 local governments participating in the Local Source Control Partnership to the concept of lean and environment and to the Lean and Green Assistance Program. In the Local Source Control Partnership, specialists conduct site visits and provide on-site technical assistance to help small businesses reduce pollution and toxics use;[10] this includes the State's Environmental Results Program pilot project with the auto body sector. Ecology will also be working more generally with local governments partners like the King County Local Hazardous Waste Program and ECOSS, a nongovernmental organization working in the Lower Duwamish Waterway that works with small and medium sized enterprises on pollution prevention programs. Ecology is also active in the Region 9 and 10 P2 Roundtables and the National P2 Roundtable (including NPPR's Lean and P2 Workgroup).

Outputs

There are several activities that need to happen to ensure a successful program. These include:

- At least 7-10 Ecology staff trained on lean manufacturing and environment;
- Marketing materials developed (e.g. a flyer on the Lean and Green service, potential benefits, and cost)
- Marketing materials disseminated to our target audience in sufficient quantities to reach our objectives
- At least 9-12 entities participating in the lean and green projects;
- Site visits or sales calls to candidate facilities
  - Very roughly 3-5 site visits/sales calls for each "signed up" facility project
  - So, if we are going to complete 9-12 projects,
    - We will have to do roughly 27-60 site visits/sales calls to prospective facilities.
- Develop a scope of work for each lean and green demonstration project.
- A workshop or presentation for Local Source Control Partnership staff.
- Develop a short case study for each project.
- Develop a memorandum summarizing potential enhancements or additions to EPA's Lean Toolkits.
- Conduct at least two lean and green workshops or webinars with our partners to disseminate results.
- Reach an audience of at least 50-100 people from business, industry and local

[10] For more information about the Local Source Control Partnership, see www.ecy.wa.gov/programs/hwtr/lsp/index.html.

governments.

- Maintain and update Ecology's Lean and Environment Website (www.ecy.wa.gov/programs/hwtr/lean).
- Share results, as we are able, regionally and nationally.
    - At least 3-5 presentations made to lean and environmental audiences at national, regional, and/or state conferences and meetings;

Outcomes and Measures

Anticipated Environmental Results: During the period for this proposal, Ecology and its partners anticipate providing lean and green assistance to about three to four businesses per year (depending on our marketing and sales success and the size of the projects), which would result in immediate environmental and operational performance improvements. Based on averaging the measured, actual pilot results from two of the three initial Lean and Environment Pilot Projects (excluding the positive outlying data from Canyon Creek Cabinets), Ecology estimates that the 9-12 lean and green projects with small to medium sized manufacturing facilities would result in the following total cost and environmental savings:

- $1-2 million cost savings to businesses;
- 250,000 –500,000 pounds of hazardous substances (toxics) used;
- 100,000–200,000 pounds of hazardous waste and 400,000–800,000 pounds of solid waste;
- 200,000–400,000 gallons of water use & wastewater discharges;
- 200,000–400,000 pounds of air emissions;
- 4,000–8,000 tons of greenhouse gases (CO_2 equivalent); and
- 100–200 million cubic feet of natural gas or an equivalent amount of kilowatt-hours.

Compliance Assurance Activities Conducted: Ecology will assess on-site compliance during site visits to facilities, provide compliance assistance to all participating facilities, and continue to meet Performance Partnership Agreement (PPA) compliance assurance obligations through inspections, education, and previously successful methods.

Measurement of Results: For all completed lean and green projects, Ecology will measure and report the estimated and actual amount of financial savings, wastes, and pollution reduced. Baseline ("before") data will be collected before and during the current state value stream mapping event and, as necessary, at the start of lean implementation events. Ecology staff will work with the lean facilitator and facility staff to obtain and analyze performance data at the end of each kaizen event for the report-out presentation. If appropriate, these results will be refined based on actual measured performance data following the last kaizen event. The facility will be asked to verify the final results in the case study produced for each lean and green project. Finally, the facility will complete a NIST MEP survey 6-12 months after the end of the project.

Past Performance – Programmatic Capability and Reporting Environmental Results

Past Performance: The following grants and agreements were approved over the past three years. Ecology successfully met the reporting requirements of the grants and agreements as required.

Grant Name	Total Budget	Federal	State	Status
FY07 P2 Lean Mfg. Grant	$190,000	$95,000	$95,000	Complete by 06/30/09
FY07 RCRA PPA	$2,515,912	$1,886,934	$628,978	Completed 6/30/07
FY08 RCRA PPA	$2,515,912	$1,886,934	$628,978	Completed 06/30/08
Totals	$5,221,824	$3,868,868	$1,352,956	

Ecology provides semi-annual progress reports to the EPA Regional Grants Manager showing the following information: 1) summary of overall results; 2) individual project tasks summary; 3) planned and schedules for task completion; 4) expenditures to date; and 5) projected accomplishments for the next reporting period.

Ecology provides quarterly progress reports related to core RCRA program measures, including the number of inspections performed, permit actions, corrective action, and the number of technical assistance actions. Ecology managers meet with EPA Region 10 staff quarterly to gauge program progress, policy issues, and program coordination.

Logic Model: See attached.

Reporting Requirements: Quarterly report updates to EPA Region 10 and Headquarters and a detailed final technical project report.

Programmatic Capacity: The Hazardous Waste and Toxics Reduction Program has approximately 105.0 FTEs, including engineers, toxicologists, environmental planners, environmental specialists, inspectors, permit writers, and pollution prevention specialists. The program typically conducts the following:

- Reduce statewide generation of hazardous waste by 2% annually.
- Track the incidence of environmental threats per inspection using the Regulatory Compliance Indicator and resolve 115 environmental threats.
- Conduct 275 pollution prevention technical assistance visits annually.
- Conduct 240 compliance technical assistance visits annually.
- Conduct 213 compliance inspections annually (including 15 TSDs, 17 recyclers, and 80 large quantity generators).
- Track the number of permits, modifications, closures and MTCA orders
- Complete intermediate corrective action steps that increase, by 5% annually, the total percent of cleanup completion for the 22 high priority facilities.
- Process 9,500 phone calls for assistance through the 1-800 hazardous substances information line.
- Improve access to website.

Resumes of Key Lean and Green Assistance Personnel:

Hugh O'Neill
Washington State Department of Ecology
Lean and Environment Project Supervisor and
Toxics Reduction Unit Manager, Southwest Region

Hugh O'Neill grew up in Central New York State, near Syracuse. He has a Bachelors degree in Geology and Environmental Science from Binghamton University in NY State and a Masters in Environmental Studies from The Evergreen State College in Washington State.

Hugh joined Washington's Department of Ecology in 1988. He worked in the hazardous waste program development office for 3 years before accepting a position managing the Toxics Reduction Unit for Ecology's Southwest Regional Office (SWRO) in 1991. Hugh managed Ecology's multi-media permit study in 1996-97 and helped found Ecology's Office of Permit Assistance (which later became the state Office of Regulatory Assistance). Hugh returned to the Toxics Reduction Unit manager position at SWRO in 1998 and contributed (in a small way) to Washington's industrial facilities meeting the statewide 50% hazardous waste reduction goal.

Since 1998, Hugh has helped to incubate and develop several new technical assistance services at Ecology including:

- Ecology's TREE [Technical Resources for Engineering Efficiency] Program (Supervisor of the first two TREE project managers from 1998 - 2003) http://www.ecy.wa.gov/programs/hwtr/tree/index.html
- Washington's Lean and Environment Project (Project Supervisor, 2005 to present) http://www.ecy.wa.gov/programs/hwtr/lean/index.html
- Ecology's Pollution Prevention and Energy Efficiency Assistance program (Project Supervisor of the Industrial Component, 2008 to present)

Hugh served on the Board of the National Pollution Prevention Roundtable (NPPR) from 2003-2007 and is the current chair of NPPR's Lean and P2 Workgroup.

Michelle Gaither
Pollution Prevention Resource Center
Technical Research Associate

Michelle is currently the Technical Research Associate at the Pacific Northwest Pollution Prevention Resource Center (PPRC) and has provided continuous technical assistance and support to government agencies and businesses in the area of pollution prevention, source reduction, and recycling since 1996. She has developed environmental case studies, technology and program reviews, and researched and prepared technical environmental guidance documentation for numerous topics.

Specific focus areas include lean and environment integration in manufacturing, carbon and toxics footprinting, and development of pollution prevention guidance documents on fiberglass fabrication, semiconductor manufacturing, the biotechnology industry, and other sectors. Michelle prepared and co-authored two of the case studies for Washington's Lean and Environment (i.e. LASCO and Canyon Creek) Pilot Projects as well as the Final Report.

Michelle has 13 years experience in P2 and recycling, including grassroots efforts to initiate environmental improvements at Battelle's Pacific Northwest National Lab, and managing research into new product development using recycled materials. She has an M.S. in Environmental Science from Washington State University **(**1995) and a B.S. in Industrial Engineering from the University of Washington (1988).

See PPRC's website: www.pprc.org

Jennifer Tice
Ross & Associates Environmental Consulting
Senior Associate

Jennifer has over eight years of experience analyzing environmental policy issues and providing organizational and facilitation support to agency and stakeholder workgroups. Jennifer is a strong writer, with excellent attention to detail and critical analysis skills. She specializes in innovative approaches to pollution prevention and waste minimization. Since 2003, she has supported EPA's Lean Manufacturing and Environment Initiative, which seeks to leverage lean business trends to improve environmental performance and reduce wastes. Jennifer co-authored several EPA lean publications, including the Lean and Environment Toolkit, the Lean and Energy Toolkit, and a report entitled "Working Smart for Environmental Protection" about state agencies that have used lean and six sigma methods to improve agency processes (these reports are available at www.epa.gov/lean).

In addition to lean and environment work with EPA and the Washington State Department of Ecology, Jennifer provides facilitation support to the Louisville and Jefferson County Metropolitan Sewer District and a multi-stakeholder "Wet Weather Team" as they develop a long-term plan to address water quality issues associated with combined sewer overflows (CSOs) and sanitary sewer overflows (SSOs). The Louisville community's integrated overflow abatement plan will make extensive use of green infrastructure to prevent pollution and reduce the size and cost of traditional "gray" solutions. Jennifer's other projects have addressed topics such as salmon recovery, area-wide soil contamination, and ecosystem restoration. Jennifer joined Ross & Associates in 2001, after graduating from the Kennedy School of Government at Harvard University with a master's degree in public policy.

See Ross & Associates website: http://www.ross-assoc.com/index.htm

Nigel Moore
Washington Manufacturing Services
Chief Operating Officer

Nigel Moore joined Washington Manufacturing Services (WMS) in December 1999. He is Vice President and Chief Operating Officer responsible for fiscal oversight, day-to-day company management, planning and execution. Prior to joining WMS he was an independent management consultant for 9 years helping companies develop, improve, diversify, and expand their business and markets. He is also a veteran of the food processing industry, having spent many years in engineering, sales and general management, working for a European food equipment company as Engineering Manager progressing to VP & General Manager and for two manufacturing companies as VP Sales and Marketing and President.

Nigel has a Bachelor of Science degree in Mechanical Engineering. He studied business and economics at Oxford University and has an Executive MBA from Northwestern.

During his tenure at WMS, Nigel has developed a business model from single point delivery engagements to an enterprise transformation model encompassing all aspects of a client's business. More than simply helping clients improve their business operations or remain viable in the marketplace, transformation is about assisting clients and their value chains compete more successfully in the global marketplace.

Nigel has supported the Washington Lean and Environment pilots and projects by working directly with candidate facilities; Department of Ecology Managers and Staff; and directing the WMS Project Managers and Manufacturing (i.e. Lean) Specialists. As COO, he directed WMS's Lean and Environment work at the three pilot project facilities and at recent Lean and Green projects (e.g. Nature's Path Foods).

Washington manufacturing Services – www.wamfg.org

8227 44th Ave. W., Suite D
Mukilteo, WA 98275
Phone: 425.438.1146 x104
E-Mail: nmoore@wamfg.org