A Proposal to the Commissioner:

LEANING at CTDEP

An Implementation Plan

April 11, 2008

Lean Defined (EPA/ECOS):

A process improvement approach and set of methods that seek to eliminate non-value added activities or waste. Kaizen events are a key to Lean's effectiveness making rapid, breakthrough improvements while creating an employee-empowered continual improvement culture. In Japanese, *kai* means "to take apart" and *zen* means "to make good"."

True leaders,
Are hardly known to their followers.
When the work's done right,
With no fuss or boasting,
Ordinary people say,
Oh, we did it.

Tao Te Ching, 17

Request to all CTDEP Managers: Review Document and Provide Comments

This Implementation Plan is a proposal to the Commissioner that sets forth a phased approach for the next twelve months to deploy a Lean Enterprise throughout the Agency. The Plan has been prepared by an informal team of staff, who attended four days of Lean training and who subsequently received Lean Enterprise Tool Certification.

In an effort to provide the Commissioner with the maximum amount of managerial insight and comment, we are requesting that all Agency managers review (using the suggested guidelines below) the Implementation Plan and provide their comments to their Bureau Chiefs, who will in turn, compile and forward these comments to Amey Marrella. These comments will be made a part of the submittal to the Commissioner for her consideration.

The following are the suggested guidelines for comments:

1. Does the Implementation Plan adequately address an approach that provides value to the Agency?

2. What are the issues/approaches that you believe are not covered in the Implementation Plan?

3. Do you agree with the recommendations covered in the Implementation Plan?

4. What would you suggest as an alternative to the recommendations?

5. Within the identified Bureau/Division Lean Implementation Proposed Projects (See Section IV, Table 1), what level of priority should be assigned? Bureaus/Divisions and Offices are welcomed to add to this proposed project list; please identify proposed project and assign priority status.

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A Proposal to the Commissioner:

LEANING at CTDEP: An Implementation Plan
April 10, 2008

To: Gina McCarthy, Commissioner
All Agency Managers

From**:** CTDEP Lean Team

Robert Bell	Peter Francis	Nicole Lugli
Jeff Caiola	Bob Girard	Amey Marrella
Karen Caliendo	Tess Gutowski	Liz Mcauliffe
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Diane Duva	Rick Jacobson	Peter Zack

Introduction

This report offers findings and makes recommendations on implementing LEAN at the CTDEP. Given the multiple authors involved (Lean Team), you will find some differences in voice and format. The common message remains consistent – we believe LEAN can help all of us at DEP to do our jobs efficiently and effectively.

It should be recognized that the CTDEP has undertaken a number of process improvements over the years and has had some success in areas such as standardizing forms and practices (i.e., permitting and enforcement documents; NOV issuance), streamlining processes (i.e., Delegation of Authority), and implementing visuals (i.e., color coded routing folders). Appendix A provides examples of Lean type of activities that have either been completed or recently undertaken by programs.

Background**:** In February 2008, Amey Marrella made a presentation at the CTDEP managers meeting on the topic of Lean (see Appendix B). The presentation provided a brief overview of Lean, described its value to CTDEP and outlined the status and next steps that would be taken. In March, the CTDEP Lean Team met a number of times and assignments were made to prepare an Implementation Plan that was to be submitted to the Commissioner for her consideration.

Definitions: There are a number of key terms that are used in the Lean Enterprise and for the purposes of this document, the following terms defined (source EPA) below:

- *Kaizen* – Means continual improvement in Japanese. Kaizen events are a key to Lean's effectiveness, making rapid, breakthrough improvements while creating an employee-empowered continual improvement culture.
- *Lean* - A process improvement approach and set of methods that seek to eliminate non-value added activities or waste.

- *Six Sigma Process* - A rigorous methodology that utilizes information (management by facts) and statistical analysis to measure and improve an organization's performance, practices, and systems.

- *Value Stream Mapping* – A process mapping method used to document the current and future states of the information and material flows in a value stream from customer to supplier.

- *5S* - A process improvement system designed to reduce waste and optimize productivity through maintaining an orderly workplace and using visual cues to achieve more consistent operational results.

Recommendations: Based on research and conversations with other states currently engaged in their own Lean journey, the CTDEP Lean Team learned that there are some overarching themes to be considered in making such a program successful for our Agency and offers the following recommendations:

- Instill a culture shift toward continuous improvement;
- Create support at all levels within the Agency;
- Create support within the regulated community;
- Keep all interested groups (internal and external) informed of changes;
- Use professional Lean facilitators; and
- Use a multi-tiered approach to Lean training.

This Implementation Plan offers three key recommendations falling under the general headings of coordination, training and implementation:

1. Coordination of Agency Lean Implementation:
   - Establish a small steering team to guide Lean implementation activities over the next 12-month period. The team shall consist of the fifteen staff that received Lean Enterprise Tool Certification. At the close of the 12 month period, this team will conduct an assessment on the Agency's use of the Lean Enterprise and make its findings known to the Agency.

2. Conduct Professional Training/Project Support:
   - Retain the services of Central Connecticut State University's Institute of Technology and Business Development (CCSU/ITBD). Use Professional Trainer/Facilitator to conduct the following types of training: (1) General Awareness Training of up to 500 staff; (2) Enhanced Training for staff participating in selected Lean Projects; and (3) Champion Training for selected staff responsible for integrating the Lean enterprise into Agency operations. For those selected projects, use an ITBD professional Lean facilitator to provide project management support.

3. Implementation of Lean Initiatives and Projects:
   - Management to select items and activities that are considered "Low Hanging Fruit" to implement. These items and activities are those that staff and management can stop

and fix along the way, without interrupting the flow of standard work practices. Provide progress report(s) to Agency staff.

- Management to identify top Lean project priorities for initial implementation (4 Summer/4 Winter) and provide project support through ITBD. These Lean Projects will be pilots, and for each project, measures are to be developed and monitored and reporting out to the Agency shall be required.

Outline of Document: After this Introduction, the Plan includes the following:

Section I – LEAN Implementation: Lessons Learned From Other States

Section II – LEAN Proposed Training Approach

Section III – "Low Hanging Fruit"

Section IV - Bureau/Division Ideas for LEANing

Appendices:

A. Examples of Lean Type Activities Completed or Underway in Various CTDEP Programs

B. Lean Presentation made at the CTDEP Managers Meeting, February 20, 2008

C. Integrating "*5S*" into CTDEP's Spring Clean-Up Day, 2008

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Section I – LEAN Implementation: Lessons Learned from Other States

Several members of the Lean Team researched the efforts of other state environmental agencies using LEAN in improving agency operations. This section provides a general summary of findings and offers recommendations that will be critical in successfully implementing Lean within CTDEP. This section also presents state specific experiences. Here's what they found:

Summary of Research Efforts:

- Of the five states identified in "Working Smart for Environmental Protection" (EPA/ECOS, October 2006) that identified Environmental Quality programs undergoing some form of LEAN Six Sigma process improvement, three report unqualified success, and two report uneven success in improving internal processes.

- Programs Most Commonly Selected for LEAN Implementation primarily based on:
    - Air Quality Construction/Operating Permits
    - NPDES Wastewater Permitting

- Principle determinant for initiating/selecting programs for LEAN implementation:
    - Complaints from regulated community

- Keys to Success:
    - Using a professional LEAN Facilitator (frequently provided by regulated community)
    - One person assigned to ensure implementation
    - Constant Gentle Pressure
    - Plan, Do, Check, Act
    - Getting commitment of managers at all levels
    - Engaging staff, both those actively involved in LEAN assessments and those performing work
    - Establishing a LEAN Coordinator (to provide constant gentle pressure)

- Keys to Failure:
    - Not selling middle managers on LEAN as a process improvement strategy
    - Institutional/staff resistance to change

- Of the seven states contacted (DE, IA, MI, MN, NE, VQ, VT), none of the natural resource management units (fish, wildlife, forestry or parks) have implemented LEAN initiatives.

Recommendations: The LEAN team recommends the following for CTDEP:

- Instill culture shift toward continuous improvement
- Create support at all levels (Executive Management to junior staff) within agency
- Create support within regulated community
- Keep all interested groups (internal and external) informed of changes
- Use professional LEAN facilitators
- Use multi-tier approach to LEAN training

State Specific Experiences:

- ***Delaware Department of Natural Resources and Environmental Control*** *(from "Working Smart for Environmental Protection")*
    - *Professional LEAN Facilitation*
        - Funding provided by Delaware Economic Development Office for facilitator from the Delaware Manufacturing Extension Partnership
    - *LEAN techniques applied*
        - Value Stream Mapping
        - Visual Controls (permit tracking boards)
        - "First In/First Out" principles
    - *Programs Addressed*
        - Air Quality Construction Permitting

- ***Iowa Department of Natural Resources*** *(from "Working Smart for Environmental Protection")*
    - *Professional LEAN Facilitation*
        - Funding for professional LEAN facilitation initially provided by the Iowa Coalition for Innovation and Growth (representing Iowa's primary industries)
    - *LEAN techniques applied*
        - Value Stream Mapping
        - Kaizen Events
        - 5-S
        - Design for LEAN Six Sigma
    - *Programs Addressed*
        - Air Quality Complex Permitting (processing time reduced 16%)
        - Air Quality Construction Permitting (processing time reduced 90%)
        - Animal Feed Operations Construction Permitting (processing time reduced 45%)
        - Clean Water Construction Permitting (processing time reduced 84%)
        - Floodplain Permitting (not quantified)
        - Land Acquisition (processing time reduced between 63 and 71%)
        - Landfill Permitting (processing time reduced 84%)
        - LUST Corrective Action Decision Making (processing time reduced 92%)
        - Administrative Order Issuance (40 to 90% improvement in lead time reduction)
        - Magazine Production (not quantified)
        - Manure Management Plans (Incomplete submittals reduced 50%)
        - NPDES Waste Water Permitting (processing time reduced 96%)
        - Vehicle Fleet Management (not quantified)

- ***Michigan Department of Environmental Quality***
  - *Professional LEAN Facilitation*
    - Provided by regulated community (General Motors)
  - *LEAN techniques applied*
    - Value Stream Mapping
  - *Programs Addressed*
    - Air Quality Permitting (processing time reduced 66%)
    - Air Quality Division log letter processing (processing time reduced – not quantified)
    - Land and Water Permitting (largely ineffective)

- ***Minnesota Pollution Control Agency***
  - *Professional LEAN Six Sigma Facilitation*
    - MN staff trained as Six Sigma champions and coaches at the green and black belt levels by the Carlson School of Management; trained staff served as facilitators for implementation phases
  - *LEAN techniques applied*
    - Not specified
  - *Programs Addressed*
    - Air Quality Construction Permitting (results not quantified)
    - NPDES Waste Water Permitting (results not quantified)
    - Administrative Penalty Order Issuance (results not quantified)
    - 18 other various projects (results not quantified)

- ***Nebraska Department of Environmental Quality***
  - *Professional LEAN Facilitation*
    - In-House staff person who teaches LEAN, a course that covers LEAN concepts, was used as a professional LEAN facilitator
  - *LEAN techniques applied*
    - Kaizen event
  - *Program Addressed*
    - Air Quality Construction/Operating Permitting (processing time reduced– not quantified)

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Section II LEAN: Proposed Training Approach

Introduction

There have been a number of state environmental agencies that have undertaken process improvement initiatives. Some of these states are working on integrating and institutionalizing a continuous process improvement culture into their respective agencies. Training is a critical support needed to implement a Continuous Improvement Program. Staff training provides exposure to the principles and practices needed to develop and sustain the Lean Enterprise.

The CTDEP has begun its own Lean Journey. Beginning in early 2007, there was internal discussion at the most senior management level about investigating Lean Enterprise as something that the Agency may want to pursue. Karen Caliendo was assigned to research training opportunities and to report her findings to Bill Evans, Amey Marrella and Matt Fritz. In the fall of 2007, Gary Rose attended an EPA sponsored Lean training in Iowa. Gary was subsequently called upon by Amey to evaluate Central Connecticut's State University's (CCSU) Institute of Technology and Business Development's (ITBD) course entitled "Lean Enterprise Tool Certification" and report back to her as to its usefulness to the agency operations. Gary reported "…that the course would be very worthwhile for DEP folks as a beginning to the Lean journey". Based on this recommendation, the Agency used CCSU's services for Lean training.

Earlier this year, senior managers attended a one-day overview training that was conducted by Fred Shamburg of Leanovations at CCSU's ITBD. He and selected CTDEP staff met and discussed modifying a four-day training course that was attended by 15 DEP managerial and program staff; each received a Lean Enterprise Tool Certification. The training provided the methodology and tools needed to begin the journey for improving processes, services, or products, in order to achieve performance breakthrough. The general consensus was that the training was useful and that some of the tools could be readily used in bringing about efficiencies in many of the programs throughout the agency. Subsequent to the training, this group (referred to as the Lean Team) met on three occasions to discuss moving forward, and training was central to the discussion.

Recommendations

Given that the agency is committed to the Lean Enterprise and it is expected that everyone at the CTDEP will be engaged, though not all at once, a phased approach to training would be appropriate. A short-term focus of 12 months is proposed, where the Agency will need to evaluate and decide whether it sees sufficient value to continue using Lean. Because of our immediacy of need and desire to begin implementation, the Lean Team focused on training opportunities afforded by ITBD. A small group met with Tom Lorenzetti, Business Development Manager with ITBD, and discussed a tiered approach to training. The following presents training recommendations; goals, objectives and implementation strategies; and a budget that the CTDEP should consider:

- Training Recommendations: CTDEP retain the services of the ITBD to undertake a tiered approach to Lean Training and Lean Event implementation:

    - General Awareness – Provides the essentials to understanding the principles and practices of Lean. Provides information describing the activities and lessons learned from several State Lean efforts, and continued implementation efforts.

    - Enhanced Training – Provides more detailed information concerning the principles of Lean and discusses practical ways to select tools and create effective organizational behaviors that will help the Lean approach to take hold in the Agency with quick and tangible benefits. Core objectives include: describing the lean principles; exploring the elements and tools of a lean enterprise system; describing the organizational impact of a lean transformation; participating in a simulation to demonstrate lean principles; defining key lean metrics and relating them to the agency's *bottom line*; determining data required to perform a lean assessment; and identifying opportunities for applying lean thinking.

    - Champion Training/Lean Team Leader - Provides intensive learning approach to teach team leaders and key members of the agency how to drive the Lean principles to improvement. Core objectives include organizing for change, managing and accelerating change, project selection, team selection and team building, and defining metrics.

    - Project Management Support – Provides facilitator services to guide a Lean project team throughout the Lean process, helping to scope out the event, facilitate the event, and advise on follow-up activities.

- Goal, Objectives and Strategies

    - Training Goal:

      CTDEP to have Lean education and training programs in place, with at least 50% of the employees in the organization receiving appropriate Lean education

    - Training and Project Management Objectives/Training Strategies:

      1. Conduct Introductory General Awareness Lean Training for up to 500 CTDEP staff (EQ, EC, Central Office).
         Strategy: *Conduct training in the Spring and Summer 2008. Training to be conducted in the CTDEP Phoenix Auditorium, 3.5 hours in length, 50 staff capacity/training session, and up to a total of ten sessions (5 days).*

      2. Conduct Enhanced Lean Training for up to eight project teams; phased approach consisting of four projects undertaken in Summer 2008 and four projects in Winter 2008.

Strategy: Conduct training consisting of 2 days, 30 to 60 staff capacity and phased in for Summer 2008 and Winter 2008. This training would be focused on those staff who would be involved in the projects selected; assumes that the general awareness training has already been taken.

3. Conduct Champion Training for a core group of CTDEP staff.
   Strategy: *Conduct training so as to assist integrating Lean into Agency culture. The training would be given to those key staff who have been identified or those selected to continue to work on strategic planning and implementation steps.*

4. Implement a number of Agency Lean projects (i.e., kaizen events, value stream mapping), supported by an experienced facilitator.
   Strategy: *Provide for Project Management Support to selected projects. The Lean Facilitator would coach and mentor staff (serving in the capacity of team lead) to build the Agency's capacity to successfully lead and execute Lean events. Provide support to CTDEP for approximately 8 days*

- Proposed Budget: Lean Training and Consulting Services – provided by ITBD.

Estimated Costs – Lean Training & Consulting Services / ITBD	
Activity	**Cost Estimate**
Training	
1. General Awareness Training	1. $10,000 (5 days)
2. Enhanced Training	2. $ 8,000 (4 days)
3. Champion Training	3. $ 8,000 (4 days)
Subtotal Training	**$26,000**
Consulting	
4. Project Support	4. $12, 800 (8 days)
Subtotal Consulting	**$12,800 (estimated)**

Other Considerations

The Lean Team also considered other options for training including public/private partnerships (gifting), Connecticut Department of Labor – Lean Government Services and CONNSTEP. A summary of these options follows:

- **Public/Private Partnerships - "Gifting"**

  There may be opportunities to seek assistance from the private sector. There are a number of manufacturers in the state who are using Lean and may be able to provide support, either by offering training or technical support, during agency Lean events. The experience with three states (Delaware, Michigan, and Nebraska) currently engaged in Lean enterprise and Six Sigma includes technical assistance from the private sector.

As part of the CTDEP Lean Team's discussions concerning training opportunities, the issue of seeking gratis assistance from the private sector was pursued. A scenario was scripted and forwarded to the Agency's legal council for consideration for comment:

- One scenario would be if CBIA*, or a company such as United Technologies, provided an instructor/consultant to provide training to employees at the CTDEP. The consultant/trainer may also provide follow-up services to facilitate an improvement project over a period of weeks or months. The services would be delivered at the CTDEP in the form of meetings. Written materials and reports may also be provided.
  - CTDEP's Legal Council Comments: Your scenario would fall under the gift-to-the-state exemption. Training of CTDEP staff must take place at DEP because in the examples you used both CBIA and UT are restricted donors. Written materials and reports would be considered a gift to the state. Need to consult with Agency Legal Council when scoped out in more detail.

* CBIA founded the CBIA Lean Sigma Institute. The Institute was created from CBIA's belief that implementation of Lean and Six Sigma principles offers Connecticut businesses, in all industry segments, significant opportunity for superior operating and financial results leading to sustainable competitive advantage. CBIA believes that the Institute fills the need for a Connecticut based, comprehensive, "one-stop" approach for Lean Sigma development and implementation. The Institute is a joint venture with R.E.V.V. International, which has been delivering Lean Sigma to companies in Connecticut and around the world for more than a decade. The Institute has specific course offerings but can provide a full suite of individual courses to enterprises. The offerings span LEAN, Six Sigma, Leadership, Organization Development, and more.

- **Department of Labor (DOL) – Lean Government Services Center**

LEAN Government Services Center was established in May 2004. The mission of the Center is to help government agencies, municipalities, and non-profit organizations develop a culture of continuous improvement with an emphasis on the relentless elimination of waste. Lean Government Services adopts waste-reducing concepts typically used in a manufacturing environment and applies the principles to procedures in government. The Center helps by identifying complex and burdensome business processes that create waste and inefficiency. The results being sought are better organizational performance, streamlined processes, and customer-focused services. The Center is comprised of individuals from a variety of units within the DOL who are dedicated to quality process improvement. DOL has undertaken a number of internal projects, and outside the DOL, assistance has been provided to CTDEP, DECD, and the Board of Education Services for the Blind.

DOL Resource/fees: DOL could send two facilitators to conduct several 1.5 to 2 hour overviews, including a "peanut butter and jelly sandwich factory" exercise, for $1,600 per day ($800 per facilitator).

- ***Remediation Division "Lean Event" using DOL Facilitators– June 2007***

  The Remediation Division performed a formal "lean event" in May-June 2007. Management's goal was to reduce processing waste, thus free up employees to shift time to more of the Division's mission critical work. Management selected an "Engineered Control Variance" application/approval process for this first lean event. This Variance was selected because it is less complex than other approvals, and processing is performed within the Division itself. Also, the processing is common to other reviews by the Division, thus it was hoped that opportunities revealed during the lean event would mirror other waste reduction opportunities in the Division.

  DOL's "Lean Government Services" was hired to facilitate the lean event. DOL provided two co-facilitators and one support staff. DEP management developed a Team Charter and selected 7 staff for the team. The team met throughout a 6-week period – 3 full days and 8 half days. At the end of June, the team generated a list of about 55 recommendations for reducing waste in processing a Variance. Few of the recommendations were quick, easy to implement opportunities for reducing waste. Most of the recommendations require temporary increased effort/tasks to create new tools (template forms, review checklist, guidance document, regulation amendments, data tracking, hiring processing technician, etc), which over the long run are expected to reduce waste. Management met with the team in July and October 2007, and February 2008, to review, select actions and evaluate progress.

  Considerations for next lean event:
  - instruct team to develop "tools" as part of the lean exercise, rather than just make recommendations,
  - limit recommendations/actions to a short-term doable number (long-term recommendations could be generated, but for purpose of future efforts),
  - give instructions to assume no additional staff and no change in law,
  - experiment with different lean vendors/facilitators,
  - compare how different facilitators guide team towards practical, doable list of short-term action items,
  - have management be more deeply involved immediately at the moment team unveils its results;
  - consider selecting a segment of a process to lean, or a segment that might be applicable to more than one process.

- **CONNSTEP**

  CONNSTEP stands for the Connecticut State Technology Extension Program and was established in 1994, with direct support from The Connecticut Department of Economic and Community Development (DECD). CONNSTEP's primary mission is to help Connecticut manufacturers apply advanced manufacturing and management techniques to become more competitive, supporting the growth of Connecticut's economy. However, through their "Lean Solutions" program, they provide both lean training and facilitative services to all types of businesses in Connecticut.

  CONNSTEP's "Lean Solutions" program manager met recently with CTDEP/Lean Team Members to discuss how CONNSTEP may be able to best assist the DEP with its lean initiatives. The following training/support options were discussed:

  - One-half day general Lean training session – This training would be tailored for our office environment and would provide the essentials to understanding the principles and practices of Lean. Class size would be limited to 20 individuals if a simulated exercise were included in the training. If the training were strictly lecture, class size could be increased, but the recommendation was not to exceed 30 individuals. The cost for this training would be $1500/day, which would provide two training sessions.

  - Lean Office Training - This two-day interactive workshop is offered periodically and provides a comprehensive overview of the Lean tools and methodologies and their application in office and service industry applications. Lean practices can be applied immediately - return to work with a firm understanding of the power of Lean Office and how to begin the implementation process. The focus on day 1 is "Office Value Stream Mapping" and "Lean Tools for the Office" is covered on day 2. Cost is $475/person.

  - 2-½ day training to develop Kaizen leaders– This training provides more in-depth lean training and graduates are expected to be able to lead Kaizen events. Cost is $1500/day for 20 individuals.

  - Continuous Improvement Champion Certification - This comprehensive, 11-week course includes a combination of classroom training, interactive simulation activities and the completion of a mentored, real-time project within the participants company. Cost is $5000/person

  - Project Management Support – Provides facilitator services to guide a Lean project team or multiple teams throughout the Lean process, helping to scope out the event(s), facilitate the event(s), and advise on follow-up activities. Cost is $1500/day for one facilitator.

Section III "Low Hanging Fruit"

The Department has many opportunities to save energy and money by reducing waste in our daily transactions. The seven wastes, concepts borrowed from lean efforts in manufacturing, are in the areas of; transportation, motion, overproduction, inventory, waiting, defects and over processing. The items and activities identified as low hanging fruit are in four major areas: 1) Physical Plant Improvements; 2) Communication Stewardship; 3) Five –S Improvements (sort, straighten, scrub, standardize and sustain); and 4) Standardization of Work. These items and activities are those that staff and management can stop and fix along the way, without interrupting the flow of our standard work practices. These items and activities purposefully do not include more comprehensive processes identified by the team that need to be leaned or go through the Kaizen break down and build up process (see Section IV).

Low Hanging Fruit

- Physical Plant Improvements
    - Add clocks, easels and conference phones in each of the conference rooms.
    - Employ clear visible indicators for all major program functions, and at the unit level, for drumbeat and urgency.

- Communication Stewardship
    - Coordinate and consolidate outreach for seasonals (plan/do/check/act - time to do again).
    - Consolidate multiple trainings for employees to use whole days, not partial days.
    - Fully utilize all field staff visits as an inter-division visit (example gasoline stations).
    - Restructure review chain to avoid bottlenecks – implement a bypass mechanism.
    - Extend electronic scheduling of conf rooms beyond basement and 6th floor.
    - Self-realization of one's own customers and suppliers (see Training – Section II).

- "*5S*" Improvements
    - Revisit delegation document (a success story in plan/do/check/act - time to do again).
    - Integrate Five "S" as part of first annual clean up day (see Appendix C for summary). Examples:
        - Deliver items to file room in bulk and organized as required;
        - Move inventory such as signs/pamphlets/fact sheets to end point for public consumption; and
        - Get supplies out of peoples' cubicles and into cabinets.

- Standardization of Work
    - Share standard work procedures and lessons learned from visual stream mapping (VSM) across agency; permitting, enforcement, issuance, closure, retention schedules, inspection checklists, buck slips, fact sheets, instructions, applications, travel, contracting, and project approval.
    - Lean deliveries of mail and paper to division.

Recommendations

The Department must demonstrate a living commitment to lean on many levels during the next twelve months. In order to jump start this mind set there needs to be visible changes that staff on all levels can contribute to and benefit from. In order to meet this objective the Lean Team is recommending that management choose one of the above items or activities from each of the categories to implement and provide direction as to who the internal suppliers and customers are in the lean process to be embarked upon. The target date for completion would be September 1, 2008 for each project. Coordinators would be chosen for each project and coordinators would report out each week on progress to a front office facilitator who would act as the project sponsor. Report out would be scheduled for the week of September 18, 2008.

Section IV: Bureau/Division Ideas for LEANING

During the development of this Implementation Plan, the CTDEP Lean Team members were asked to identify ideas for Lean implementation – ranging from relatively easy ones to act upon through to the more complex projects that would require kaizen events or value stream mapping exercises. Listed below are the ideas submitted and a summary table is provided at the end of this section.

Bureau of Air Management, Division of Enforcement and Air Permitting

- Enforcement Programs
  1. Document standard work practices/procedures and update documents to improve efficiency and product quality.
     - Update NOV issuance procedures and templates. Provide staff training when these updates are completed.
     - Develop standard inspection procedures/guidelines and check lists for specific types of inspections. Odor inspections guidance has been completed. Planned efforts include open burning, outdoor wood-burning furnace and fugitive dust inspections.

  2. Fully populate and utilize recently created database for tracking source air emissions testing notifications, tests and reports. Database will enables supervisor to better distribute and manage unit's work. A fully populated database will provide a much needed inventory of past air emission test results and facility air emission testing requirements. This gives the department the ability to send out advance notice letters for required tests, effectively track compliance with air emission test deadlines, and implement a program of requiring emissions testing at facility's that have not performed testing in a number of years.
     - Redesign Title V Compliance Certification review program to do away with redundancy. Currently, office staff perform an "in-depth" review of <u>all</u> submitted Title V Compliance Certifications while an “in-depth” review is also performed for at least <u>half</u> of the submitted Title V Compliance Certifications during facility inspections (Title V sources are inspected once/2 years). A kaizen event is planned for this program.
     - Taking advantage of simple and very doable multi-media inspection opportunities. E.g., Air can help UST at gas stations and visa-versa. Air can also help evaluate compliance of the state's recycling laws during facility inspections.

  3. Implement clear visible indicators for all major air enforcement program functions. This will ensure staff is aware of the customer drumbeat and create the necessary senses of urgency. The indicators will also help staff celebrate their accomplishments.

- Permitting Programs
  1. Update application forms so the required information is submitted -- to minimize information requests and notices of insufficiency.
  2. Develop a Fact Sheet on how to expedite the permitting process. This fact sheet would be placed on the web and outline the permitting and modeling process and provide helpful tips to quicken the review process.
  3 Develop a single permit template for all equipment. As part of the template similar monitoring, record keeping and reporting requirements can be established for specific source categories to foster consistency. If a single template is not appropriate then update templates for the specific source categories.
  4. Update office procedures. Permitting is heavily dependent on administrative process. Administrative procedures change with new regulatory initiatives and delegation of authority amendments. Updating these procedures will document standard work and will be a valuable tool for new administrative personnel, seasonals, or temporary workers. Once benchmarked the procedures can be VSM to identify inefficiencies.
  5. 5-S the form letters and templates. This will result in fewer "give-backs". Form letters and templates are continuously updated and it has been a challenge getting the engineers to ensure the correct letter or template is used.

Bureau of Materials Management and Compliance Assurance

- Emergency Response and Spill Prevention Division
  1. Create an Underground Storage Tank and PCB field NOV. (standard work practice and delegation of authority to increase inspection and compliance rates)
  2. Create visuals (chart type)
     - Chart One: Storage Tank Enforcement Unit
       - Number of UST inspections completed per month.
       - Total number of inspections competed toward 3- year goal of completing 4,300 inspections.
       - Number of red tags issued, number of NOV's issued vs. number complied with.
     - Chart Two: Emergency Response Unit
       - Monthly basis
       - Number of spills reported number of spills responded to
       - Number of spills with DEP lead (spill funded)
       - Number of incident reports completed and number out standing

- Chart Three: Site Assessment and Support Unit
    - Monthly basis
    - Number of leaking underground storage tanks report to DEP (for federal reporting requirements)
    - Number of cleanups determine to be complete (federal reporting requirements)
    - Number of sites investigated
    - Number of samples analyzed by the mobile lab

3. Lean the Division's equipment inventory, maintenance and repair procedures.
4. Sort division office supplies, and files.
5. Redraft/update the underground storage tank registration form and make it available on line for owners and operators to fill out in PDF format. (form has not been updated in 20 years).

- Waste Engineering and Enforcement Division

1. 5S - For floor remove file boxes from conference room 4B; install white boards and bulletin boards in conference rooms B, C, D.
2. Visual Controls - Create status boards in room 4C to identify the queue and flag backlogged and bottleneck areas for inspection and enforcement process, including: pesticides inspections, solid waste inspections, hazardous waste inspections, solid waste permitting process, progress in closing open cases (return to compliance. Post review status of hazardous waste regulations revision to sustain drum beat and urgency. Post number of solid waste operator and pesticide applicator/supervisor certifications to celebrate accomplishments.
3. Standard Work - Create standard form letters for processing and referring complaints in solid waste program, including recycling complaints. Create SOP handbook [especially for new employees] by gathering existing information into consolidated location.
4. Identify and Eliminate Waste - Determine baseline timeframes for inspection processes in solid waste enforcement and hazardous waste programs. Conduct process flow mapping on inspection processes. Determine baseline timeframes for enforcement processes in solid waste enforcement and hazardous waste programs. Conduct value stream mapping on WEED enforcement processes.
5. Conquer Complexity - Create electronic case management system for solid waste and hazardous waste program staff to provide staff and supervisors with ability to balance workload and to identify and sort by due dates the actions required of order respondents, judgment defendants, permit applicants.

- Water Permitting and Enforcement Division

1. Conduct a LEAN event focusing on improving WPED's Enforcement programs. Representatives from each of WPED's enforcement groups (Field

Compliance and Enforcement, Industrial Enforcement, Stormwater, and Subsurface and Agriculture) would form part of the Kaizen team. Other team members may include one of WPED's processing technicians and enforcement staff from other programs. The team's objectives would include the following: 1) conduct value stream mapping on WPED's enforcement processes; 2) identify wastes and establish baseline measures for WPED's enforcement processes; 3) establish standard operating procedures for certain WPED enforcement activities, such as establishing uniform guidelines for escalating or closing NOVs and calculating penalties; and 4) create checklists and create or improve established formats where necessary.

Bureau of Water Protection and Land Reuse

- Inland Water Resources Division
  1. Sufficiency Reviews. The division could utilize the LEAN process to help develop a value stream map and standard work procedures for logging in a file and conducting sufficiency reviews in a timely manner, which in return will help reduce the permit backlog.
  2. Uniform filing procedures. Each program in the division files applications differently which can lead to confusion when looking for something. This would be a good candidate for visualization.
  3. Format for the tentative determination notice. Most of the regulatory programs (Inland Wetland, Stream Channel Encroachment Line, Water Diversion, Water Quality Certification, Dam Safety, Flood Management-Exemptions) require a public notice before issuing a decision. The format for the public notice for each program varies and there is some duplicative effort in drafting the public notices versus information that is found in staff's technical memorandums.

- Office of Long Island Programs
  1. Institute a similar tracking system (PO1 Report) on our enforcement program for inspections.
  2. Consolidation of public notice processes (currently 3x per application).
  3. Reducing the "narrative" in our initial permit-review response letters.
  4. Creating staff town assignments.
  5. Simplify the closure process on completed enforcement actions.
  6. Clarify the data entry process to reduce duplicative fill-in forms.

- Remediation Division
  1. Focus on 5 Ss for the Division, as a necessary preliminary step.

Bureau of Natural Resources

- Inland Fisheries Division
  1. Permitting and Authorizations (Minor Programs)
     - Importation and Liberation of Fish and Live Fish Eggs (permitting and database)
     - Triploid Grass Carp Importation, Possession and Liberation (permitting and database)
     - Bait Dealers (licensing and database)
     - Scientific Collectors (permitting and database)
     - Tournament Derbies (scheduling, permitting and database)
  2. CARE Classes (scheduling)
  3. Special Regulations for Association Controlled Waters (early opening authorizations, etc, and database)
  4. Fish Culture
     - Facility specific operation and maintenance
     - Stocking/Distribution)
- Wildlife Division
  1. Education/Firearms Safety (scheduling)
  2. Natural Diversity Data Base management and services
- Applicable to All Divisions
  1. Travel (requests, arrangements, reimbursements)
  2. Project Requests (request, approval, tracking, implementation)
  3. Contracts (execution, administration)

Bureau of Financial And Support Services

- Human Resources
  1. Request for Position Action Process (partner with Financial Management)
  2. Applicant Tracking and Selection for Entry-Level Positions (partner with Affirmative Action)
  3. Training Application and Data Entry Processes
  4. Streamline Process for Updating Telephone Numbers in CORE-CT (partner with OIM)

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Table IV – 1. Summary Listing of Bureau/Division Ideas for Implementing Lean Projects

Bureau	Division	Idea Number	Idea	Tier Ranking		
				High	Medium	Low
AM	Enforcement and Permitting, Enforcement Program	1.	Document standard work practices/procedures and update documents to improve efficiency and product quality.			
		2.	Fully populate and utilize created database for tracking source air emissions testing notifications, tests and reports.			
		3.	Implement clear visible indicators for all major air enforcement program functions.			
	Enforcement and Permitting; Permitting Program	1.	Update application forms so the required information is submitted to minimize information requests and notices of insufficiency.			
		2.	Develop a Fact Sheet on how to expedite the permitting process.			
		3.	Develop a single permit template for all equipment.			
		4.	Update office procedures.			
		5.	5-S the form letters and templates.			
MM & CA	Emergency Response and Spill Prevention	1.	Create an Underground Storage Tank and PCB field NOV.			
		2.	Create visuals.			
		3.	Lean the division's equipment inventory, maintenance and repair procedures.			
		4.	Sort division office supplies, and files.			
		5.	Redraft /update the underground storage tank registration form and make it available on line for owners and operators to fill out in PDF format.			
	Waste Engineering and Enforcement	1.	5S - for floor.			
		2.	Visual Controls - Create status boards in room 4C to identify the queue and flag backlogged and bottleneck areas for inspection and enforcement process			
		3.	Standard Work Create standard form letters for processing and referring complaints in solid waste program, including recycling complaints. Create SOP.			
		4.	Identify and Eliminate Waste - Determine baseline timeframes for inspection processes in solid waste enforcement and hazardous waste programs. Conduct process flow mapping on inspection processes. Determine baseline timeframes for enforcement processes in solid waste enforcement and hazardous waste programs.			
		5.	Conquer Complexity - Create electronic case management system for solid waste and hazardous waste program			
	Water Permitting and Enforcement	1.	Conduct a LEAN event focusing on improving WPED's Enforcement programs.			

Bureau	Division	Idea Number	Idea	Tier Ranking		
				High	Medium	Low
WPLR	Inland Water Resources	1.	Sufficiency reviews – Develop a value stream map and standard work procedures for logging in a file and conducting a sufficiency review.			
		2.	Uniform filing procedures – visualization.			
		3.	Format for the tentative determination notice.			
	Office of Long Island Programs	1.	Institute a tracking system (PO1 Report) on their enforcement program fro inspections.			
		2.	Consolidation of public notice processes.			
		3.	Reduce the narrative in their initial permit-review response letters.			
		4.	Creating staff town assignments.			
		5.	Simplify the closure process on completed enforcement actions.			
		6.	Clarifying the data entry process to reduce duplicative fill-in forms.			
	Remediation	1.	Focus on 5 Ss for the Division, as a necessary preliminary step.			
BNR	Inland Fisheries	1.	Permitting and Authorizations (Minor Programs)			
		2.	CARE Classes (scheduling)			
		3.	Special Regulations for Association Controlled Waters (early opening authorizations, etc, and database)			
		4.	Fish culture.			
	Wildlife	1.	Education/Firearms Safety (scheduling)			
		2.	Natural Diversity Data Base management and services			
	Applicable to All Divisions	1.	Travel (requests, arrangements, reimbursements)			
		2.	Project Requests (request, approval, tracking, implementation)			
		3.	Contracts			
BFSS	Human Resources	1.	Request for Position Action Process (partner with Financial Management)			
		2.	Applicant Tracking and Selection for Entry-Level Positions (partner with Affirmative Action)			
		3.	Training Application and Data Entry Processes.			
		4.	Streamline Process of Updating Telephone Numbers in CORE-CT (partner with OPM).			
Other Bureaus or Offices	Other Divisions of programs					

Appendices

Appendix A. Examples of Lean Type Activities Completed or Underway in Various CTDEP Programs.

Appendix B. Lean Presentation made at the CTDEP Managers Meeting, February 20, 2008

Appendix C. Integrating "5*S*" into CTDEP's Spring Clean-Up Day, 2008

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Appendix A: Examples of Lean Type of Activities Completed or Underway in Various CTDEP Programs

Bureau/Division	Lean Type of Activity
MM&CA/Emergency Response and Spill Prevention	**Implementation of Lean Improvements in ERSP Underway Spring 2008** • Use of announced UST inspections to streamline the inspection time (pilot underway) • Electronic/paperless UST inspections (IT approved project underway) • Computer aided dispatching and follow up to emergency spills.
MM&CA/Waste Engineering and Enforcement	**Implementation of Lean Improvements in WEED March 2007-March 2008** • **5S** Sorted files and cleaned cubicles of retired employees. Sorted and standardized office supply cabinet and implemented system to sustain organization. • **Visual Controls** Began incorporating monthly progress review with quick look at updated charts of inspections completed and enforcement actions issued compared to average of previous years for solid waste and hazardous waste enforcement programs and compared to EPA grant commitments for hazardous waste inspections. • **Identify and Eliminate Waiting** Notice of Violation ("NOV") signature authority was delegated to all staff. Delegation includes field-issued NOVs. • **Identify and Eliminate Wastes** in transportation and motion. Work areas of hazardous waste manifest staff were relocated, keeping files and staff members together, instead of spread out throughout the floor, also allowing rotation of staff to help balance the load of covering front reception desk and to promote among other staff members an increased understanding of manifest volume and process value. • **Standard Work** Integrated recycling permitting and enforcement functions into mainstream solid waste permitting and enforcement programs to promote standard work and to free recycling staff to focus on revitalizing program development such as beneficial use permitting and organics recycling permitting. • **Conquering Complexity** Key Indicator Inspections conducted to focus hazardous waste inspection resources. If the facility receiving inspection is in compliance with key elements, the full inspection is not conducted.
MM&CA/Water Permitting and Enforcement	**Implementation of Lean Improvements in WEED March 2006-March 2008** • The work areas of the WPED Field staff were reconfigured to allow for better organization and personal workspaces. Each of the 5 Environmental Analysts was given his or her own workspace and file cabinet rather than a having shared work areas without appropriate means to organize case files. • Project planning charts have been utilized by several WPED groups to track the progress of individual permitting and/or enforcement cases. • Two policy workgroups (general and enforcement) have been established to promote consistency within the division by establishing SOPs.

<table>
<tr><th>Bureau/Division</th><th>Lean Type of Activity</th></tr>
<tr><td>MM&CA/Water Permitting and Enforcement</td><td>

The work area of the WPED receptionist/office assistant was relocated. The work area was moved to a more visible location closer to the elevator to better serve the visitors to WPED. Moving the workspace also vacated a valuable, and much needed professional workspace. WPED and Remediation were able to swap work areas to accommodate the relocation of several staff from the 4th floor to the 2nd floor.
The Assistant Director maintains a white board outside of her office and clearly visible to staff and managers to show: 1) where case folders are in the managerial approval loop, 2) dates notices were published in the newspaper, 3) dates related to hearing activities, and 4) priority permits. It is continually updated.
WPED has separated the industrial permitting and enforcement duties into two groups, each having its own supervisor. In addition, WPED established a separate group dedicated to implementing its stormwater program.

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<tr><td>WPLR/Office of Long Island Sound Programs</td><td>
Implementation of Lean Improvements in OLISP Underway Spring 2008

Visuals: The quarterly PO1 report (see below) has been a great tool to provide feedback to staff on pending applications and what needs to get done. Add in some "constant gentle pressure", and viola! we have reduced our pending backlog from 41 to 3 in just one quarter!

<table>
<tr><th>QUARTER</th><th>PENDING >12 Months</th><th>PENDING 6-12 Months</th><th>PENDING 3-6 Months</th><th>LATE REVIEWS</th><th>PENDING < 3 Months</th><th>TOTAL PENDING</th></tr>
<tr><td>PENDING LAST Q: 01/01/08</td><td>7</td><td>12</td><td>22</td><td>41</td><td>21</td><td>62</td></tr>
<tr><td>PENDING THIS Q: 04/01/08</td><td>0</td><td>1</td><td>2</td><td>3</td><td>33</td><td>39</td></tr>
</table>
</td></tr>
<tr><td>WPLR/Remediation</td><td>
Implementation of Lean Improvements in Remediation Underway Spring 2008

Electronic shared-drive (S-drive) overhaul (completion date April 2008).
General Permit for certain treatments of groundwater plumes.
Standardization of ECAF (Environmental Condition Assessment Form-Transfer Act submittal) (completion date April 2008 for some tools).
Standardized reviews of Engineered Control Variances (some steps to be completed April2008).

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Appendix B: Lean Presentation made at the CTDEP Managers Meeting, February 20, 2008

LEAN at DEP

- Brief introduction to LEAN
- Value of LEAN to DEP
- Status of LEAN at DEP and Next Steps

WHAT is LEAN?

- LEAN is "a process improvement approach and set of methods that seek to eliminate non-value added activities or waste." ECOS/EPA
- LEAN originally developed for manufacturing, now adapted to office environments, too.

LEAN at Environmental Agencies

- ECOS and EPA have produced two documents on LEAN:
- "Working Smart for Environmental Protection: Improving State Agency Processes with Lean and Six Sigma"
- "Lean in Government Starter Kit"

LEAN INFO on the WEB

- ECOS/EPA documents are available at:
    - www.epa.gov/lean
- Also can look at:
    - http://lean.iowa.gov/index.html
    - Other states include Michigan, Delaware, Minnesota, and Nebraska as of October 2006

LEAN SUCCESSES

Examples:

- MICHIGAN decreased time to process major air construction permits from 422 to 98 days.
- IOWA streamlined corrective action process in their LUST program, dropping the average decision making timeframe from 38 to 3 months.
- IOWA streamlined land acquisition (best case) from 24 to 9 months.
- IOWA redesigned its magazine.

LEAN identifies and eliminates WASTE

- ECOS/EPA have identified several common permitting process wastes, including:
- Incomplete applications
- Backlogs
- Approval bottlenecks
- Redundant review or data entry
- Lack of templates

LEAN identifies and eliminates WASTE (Leanovations)

• TOMDWIP	OFFICE EXAMPLES
o Transportation	(poor office layout)
o Overproduction	(printing drafts too soon)
o Motion	(re-entering data)
o Defects	(incomplete paperwork)
o Waiting Time	(meetings start late)
o Inventory	(inbox accumulates)
o Processing	(excessive approvals)

LEAN – 5S Defined

- Sort (dispose of what isn't needed)
- Set in order (organize what remains)
- Shine (clean)
- Standardize (maintain guidelines for the first three S – so they become routine)
- Sustain (develop a steady habit)

LEAN – 5S

- "5S is often used to ready the workplace for future kaizen events and continual improvement." Starter Kit
- Can apply to:
- record retention training and clean up days,
- parks maintenance facilities and hatcheries,
- even supply cabinets

LEAN - Visual Controls

Visual controls share information efficiently:

- Include signals, charts, signs, etc. to:
  - Define expected outcomes
  - Flag challenges to achieving expectations (Leanovations)
- Examples:
  - direction and information signs at Parks
  - colored file folders
  - large whiteboard listing projects and deadlines

LEAN – Kaizen

- "Kaizen event" or "LEAN event" are two names for the same thing.
- "Kaizen" combines two Japanese words that mean "to take apart" and "to make good."
- Kaizen events often involve value stream mapping (VSM).
- VSM develops a visual of the process flow, from start to finish. Helps to identify waste.

VALUE of LEAN to DEP

- We will become more efficient, without lowering our environmental requirements.
- Staff will identify and implement the improvements, not management alone.
- Improved efficiency will give us more time to protect the environment, which includes addressing new environmental challenges.

LEAN at DEP: Status and Next Steps

- Informal team now developing an implementation plan, following introductory training
- Everyone at DEP will be engaged, not all at once
- LEAN takes time to catch on, requires time and management commitment
- Not easy to achieve LEAN culture, but once staff see the waste, the solution is common sense
- Other agencies have implemented LEAN, with proven success

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Appendix C: Integrating 5S into Spring Clean-Up Day

Goal: Sort, organize, clean, standardize guidelines, and sustain file management

Why: To maintain efficiency in our daily work in our individual and common areas.

How:

1. Determine who (person or persons, including the sub-Records Management Liaison Officer [“RMLO”]) in your bureau and division will be annually responsible for document management, conducting disposal/recycling. Determine timeframe for annual disposal.

2. Inventory the documents. Include confidential documents. Remember to include: cubicles, cabinets, file room and West Hartford. Send these lists to your sub-RMLO. http://www.cslib.org/publicrecords/Forms/rc104rev.doc

3. Identify items found during your document inventory that are not on your record Retention schedule and send this list of documents to Veronica Ferriss, our RMLO. [Determine if Veronica needs form for people to use when submitting questions to her.]

4. Estimate the volume of documents (in cubic feet) for disposal. Determine which documents should be shredded prior to recycling. Determine whether a shredder service will be available during your clean-up event. [Paul Farrell is working with Bill Evans to consider shredder truck for this year’s clean-up days.]

5. Designate a floor contact for organizing and maintaining reuse and recycling stations [swap shop] and field questions on what is recyclable. Provide designated stations for storing re-usable items for DEP use or to send to surplus. Establish a space to collect binders, hanging files, staplers, rulers, binder clips, computer diskettes, book ends, file sorters, coffee mugs, etc.

6. Draft and get sign off approval for a disposal request under the general S1 schedule: http://www.cslib.org/publicrecords/stateretsched/stateadmin.pdf http://www.cslib.org/publicrecords/forms/RC108.doc Draft and get sign off approval for a disposal request under the divisions' applicable record retention schedule. If the work unit has changed names or been moved, just identify "formerly known as xxxx" on the disposal request. http://www.cslib.org/publicrecords/forms/RC108.doc

7. Create a quick reference guide on records retention and determining which types of documents must be retained. This reference guide could be made into a poster and placed in appropriate places; reference guide could be placed on the intra-site, as well as having a hardcopy version for each division placed in a central location and available for staff. [Paul Farrell is working on this with Veronica Ferriss.]
8. Obtain additional recycling bins for paper and other materials needed on a permanent basis and any additional containers needed just during the clean-up day.[Mary Sherwin is working on this with Paul Farrell to request 90-gallon toters from hauler].

9. Reserve conference rooms for the cleanup day so that groups can cull common files together if needed and so that materials can be separated for recycling [paper out of notebooks, folders from paper, etc.]. [Mary Sherwin is creating a quick reference guide for what is recyclable.]

10. Establish guidelines for filing public files and culling desk files of employees leaving the division or agency. Return all equipment not being used to a bureau swap shop or to the agency's purchasing (business office) for reuse. Ensure the empty cubicle is not a dumping ground for documents and materials that are unwanted. Post signs.

11. Maintain and continue the process and method for creating and maintaining an organized, clean, and high performance workplace.