

**ODOR MANAGEMENT PLAN**

**Facility's Name:** L.J. Smith Dairy Farm

**Address and other contacts:** 000 Dairy Farm Rd., Pullman, WA, 99164-0001  
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**Facility's Owner:** Lund J. Smith and Sons Inc.

**Address and other contacts:** Same as above.

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**Preparer's Name:** Mr. Odor Fighter

**Preparer's Signature:** *OdorFighter*

**Preparation Date:** January 5, 2005

**Preparer's Organization/Institution:** Odor-fighters Engineers Inc.

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**Reviewer's Name:** Mr. Odor Expert

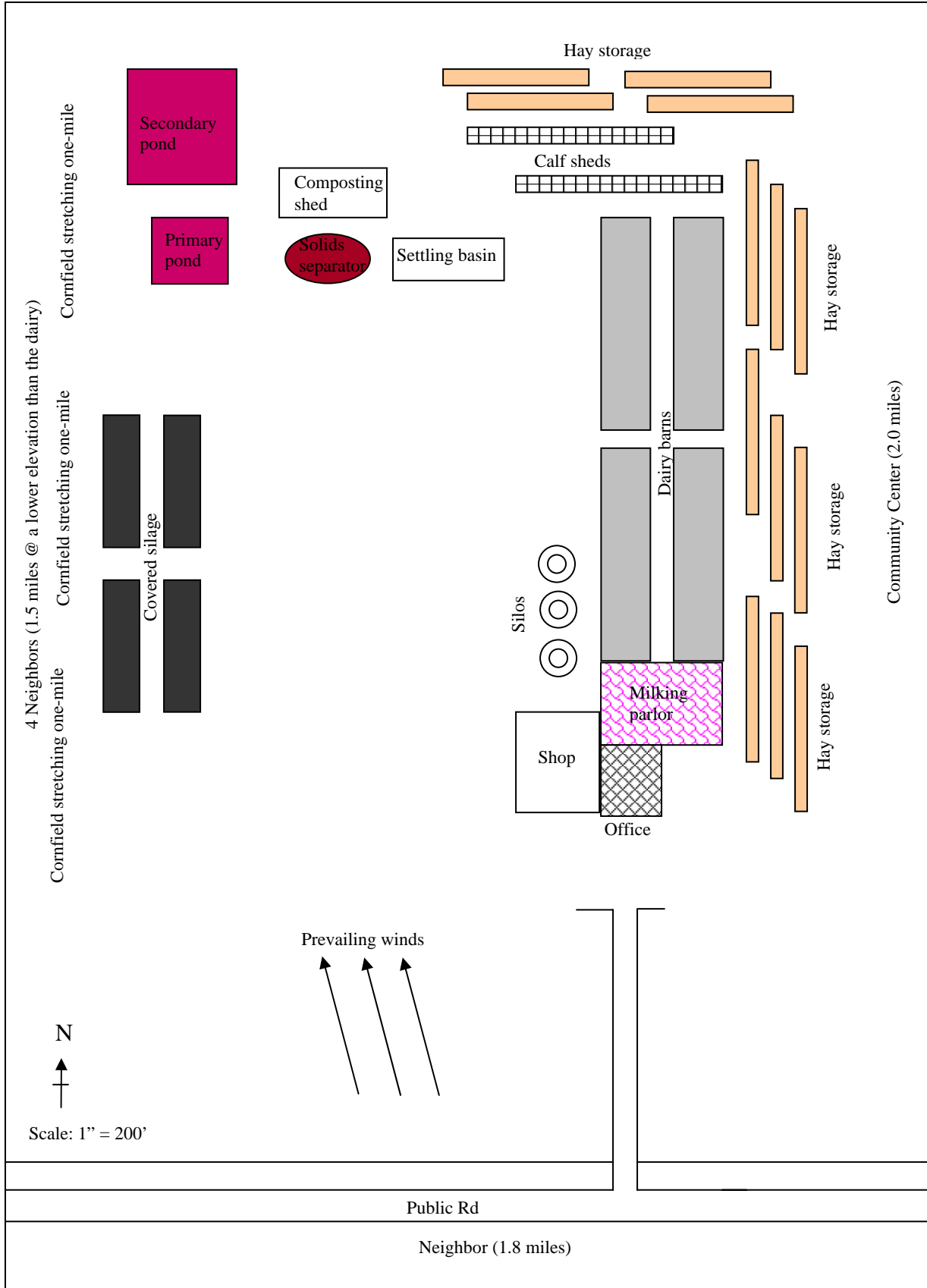
**Reviewer's signature and date of review:** *OdorExpert*

**Reviewer's Affiliation:** Washington Department of Ecology and Agriculture

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# L.J. Smith Dairy Farm



**ODOR INVENTORY: L.J. Smith Dairy Farm**

<b>Potential source</b>	<b>Description of the source</b>
Dairy barns	House 1200 dairy cattle. Use sand bedding. Concrete floors and flushing gutters (manure collected as slurry). Flushes twice a day. Covered raised roofs to keep rain out and aid ventilation. Good drainage all around the barns, i.e. no storm water can access the barns.
Feed alleys	Scrapped clean every day. Fairly clean feed alleys (no noticeable feed spillages).
Calf-sheds	Covered sheds. Fresh straw-bedding placed every two weeks after clean-out. Supplemental ventilation only during summer (Exhausts through the North façade).
Solids-liquid separator	Not covered. Separated solids removed to the composting-shed every other day. Size is approximately 8,000 ft <sup>2</sup> .
Composting shed	Size is 9,000 ft <sup>2</sup> . Covered and well kept. Used straw scrapped from calf-sheds and from barns provide needed organic base. Piles turned every fortnight to promote composting. Currently, most (90%) of compost is sold off. The remainder is used on the farm to fertilize the loan, for the flower gardens, and a small vegetable garden.
Primary lagoon	Size is 9,000 ft <sup>2</sup> . Pond is dark-brown and is almost over-flowing.
Secondary lagoon	Size is 24,000 ft <sup>2</sup> . This lagoon is deep purple but a little lower than the Low-line mark.
Silage storage	Laid on concrete pad and with individual plastic covers. Problem: drainage is poor around the piles. Storm water can get on the pads and possibly underneath the silage piles. Size is 60,000 ft <sup>2</sup> .
Milking parlor	Pressure-hosed down twice a day (after each milking session) into a covered concrete holding pit (4,000 ft <sup>3</sup> – 20’*20’*10’; 1,600 ft <sup>2</sup> ) from where it is pumped every day through a 4”PVC pipe directly into the primary pond.
Settling basin	Size is 8,250 ft <sup>2</sup> . Not covered. Scrapped clean weekly.
Manure application in the corn-field	Spray irrigation of the corn-field from secondary lagoon only using medium pressure close to crop cover during spring and summer seasons. Irrigation is scheduled one day a week throughout spring and summer and excludes all Sundays.
Agitation	Secondary lagoon only is agitated prior to every irrigation schedule using a pressurized stream of manure below the manure surface.

**ODOR POTENTIAL ASSESSMENT: L.J. Smith Dairy Farm**

<b>Source</b>	<b>Rating</b>	<b>Overall ranking</b>	<b>Comments</b>
Dairy barns	Low potential	8	Large area; maintaining status is the only challenge.
Feed alleys	Low potential	11	Assuming status is maintained.
Calf-sheds	Low potential	9	Assuming status is maintained.
Solids-liquid separator	Medium potential	4	Small area but persistent round the year, i.e. works round the year.
Composting shed	Low potential	12	Assuming status is maintained.
Primary lagoon	High potential	2	Medium surface area; closer to neighbors on the west; persistent throughout the year; low elevations of the neighbors' residences is big negative.
Secondary lagoon	Low potential	7	Large area; open surface.
Silage storage	Medium potential	6	Large area but problem only part of the year – wet seasons.
Milking parlor	Low potential	10	Assuming status is maintained.
Settling basin	High potential	3	Small surface area; further from west neighbors.
Manure application in the corn-field	High potential	1	Large area; closest to west neighbors; application does not consider weekend and holidays or wind conditions; low elevation of the neighbors' residences is a big problem.
Agitation	Medium potential	5	Large area but occurs only part of the year.

**Notes:** Comparison is done within each category (high, medium, low) to establish the overall ranking. Relative terms (small, large, closer, etc) are, therefore, based on the sources in each category.

**ODOR CONTROL STRATEGIES: L.J. Smith Dairy Farm**

<b>Source</b>	<b>Control technologies/strategies or good housekeeping</b>	<b>Implementation protocol</b>
Manure application in the cornfield	<ol style="list-style-type: none"> <li>1. Application scheduling</li> <li>2. Dilution</li> <li>3. Shelter belt</li> </ol>	<p>Tier 1: Application during holidays and weekends should be avoided all together. Weather conditions should also be used to schedule application to avoid calm wind conditions.</p> <p>Tier 2: Mixing of one part of lagoon water with at least 3 parts of freshwater before irrigation.</p> <p>Tier 4: If the above two strategies do not work, a line of trees along the West fence-line shall be planted as an added measure to reach acceptable odor conditions.</p>
Primary Lagoon	<ol style="list-style-type: none"> <li>1. Lagoon loading/unloading</li> <li>2. Aeration</li> <li>3. Lagoon cover</li> </ol>	<p>Tier 1: Over-flowing shows problem in the lagoon management. Frequent emptying schedule into the secondary lagoon may solve this problem. Secondary lagoon has space anyway. Recommended for the next 4 months: weekly monitoring of odor situation.</p> <p>Tier 2: If odor persists at this point; pond aeration should be implemented and odor situation evaluated for another 4 months.</p> <p>Tier 3: If tier 2 does not work, a plastic lagoon cover shall be considered next. Non-porous plastic covers though expensive are 95% odor proof.</p>
Settling basin	<ol style="list-style-type: none"> <li>1. Frequent cleaning</li> <li>2. Wall</li> </ol>	<p>Tier 1: Twice weekly cleaning schedule should be adopted immediately.</p> <p>Tier 2: A wall on the Westside of this basin may be considered if the odor problem from this source persists.</p>
Solids separator	<ol style="list-style-type: none"> <li>1. More frequent solids removal</li> <li>2. Roof/cover</li> <li>3. Westside walling</li> </ol>	<p>Tier 1: Daily removal of separated solids into the composting shed.</p> <p>Tier 2: If problem persists (expected during wet season), a roof-cover shall be installed next.</p> <p>Tier 3: A Westside walling on the covered area will be considered after this if the problem persists.</p>
Agitation	<ol style="list-style-type: none"> <li>1. Schedule agitation</li> <li>2. No agitation</li> </ol>	<p>Tier 1: Agitation will be tied to irrigation schedule and bound by the same weather conditions or limitations.</p> <p>Tier 2: If agitation persists in being a real problem, its abandonment will be considered next.</p>
Silage storage	<ol style="list-style-type: none"> <li>1. Proper drainage</li> <li>2. Build a shed(s)</li> </ol>	<p>Tier 1: Proper drainage will be provided all around the silage storage concrete pad.</p> <p>Tier 2: Instead of individual covers, an overall</p>

		covered shed will be considered next. This is easier to drain and will keep external moisture from weather elements away from the pad altogether.
Secondary lagoon	1. Lagoon management 2. Aeration	Tier 1: Lagoon management requires proper maintenance of design levels. This will carefully be observed in the future. Tier 2: This lagoon seems to be in excellent working condition and aeration shall be considered in the future if odor evaluation shows odor emanating from this source.
Dairy barns	1. Good housekeeping	No extra action required as of now except to maintain and where possible improve good housekeeping practices.
Calf-sheds	1. Good housekeeping	No extra action required as of now except to maintain and where possible improve good housekeeping practices.
Milking parlor	1. Good housekeeping	No extra action required as of now except to maintain and where possible improve good housekeeping practices.
Feed alleys	1. Good housekeeping	No extra action required as of now except to maintain and where possible improve good housekeeping practices.
Composting shed	1. Good housekeeping	No extra action required as of now except to maintain and where possible improve good housekeeping practices.

**Notes:** The Manager of L.J. Smith Dairy Farm will be responsible in overseeing the implementation of these odor control strategies. A one year full implementation period is recommended with evaluations every four months during this time.

## **ODOR COMPLAINT RESPONSE: L.J. Smith Dairy Farm**

### **Relationships with neighbors**

The neighbors to the West of the Dairy Farm are the most vulnerable to odor emanating from this Farm. All the four of them will be contacted and meeting arranged so that they can be appraised on the “odor control strategies and implementation”. Their involvement will be sought at this meeting especially in monitoring the progress during the implementation phase. Throughout the implementation, monthly meetings will be arranged to discuss the implementation progress and to review odor situations so far.

### **Monitoring and record keeping**

In between the monthly meetings, these neighbors will be encouraged to report extreme odor situations as they perceive them when they occur on a scale of three: 1=detectable odors, 2=recognizable odors and 3=Very distinct and annoying odors. The date and time of these events will be recorded. Similarly, the action(s) taken to remedy the respective odor situations will be noted down.

A tour of the farm around the fence-line will be conducted every week at four different times of the day (8.00 am, 2.00 pm, 6.00 pm, and 10.00 pm) during normal week operations. Extra tours to monitor the odor situations will be done at least once during either of the following events/activities: Agitation, irrigation, solids-liquid separation, cleaning of the settling basin, and during flushing of the barns. Similar criteria (1, 2, or 3) as that used above will be used during these odor monitoring tours.

### **Implementation records**

The records of the implemented strategies will be kept up-to-date and shared during the monthly meetings with neighbors and with the relevant County Extension Agents. Problems encountered during the implementation and alternative implementation strategies will be noted and similarly shared during the monthly meetings.

### **Evaluation of the control strategies**

At the end of every implementation stage (tier), a thorough evaluation of the control strategies implemented will be conducted by a “trained odor panelist”. This evaluation will be conducted independently and at the fence-lines of the farm. The results will be shared with owners of the Dairy as well as with other interested parties (neighbors, community leaders, County Agents, etc). At this point decisions will be made on the way forward to meet acceptable odor reduction goals. At these meetings, the community will also become educated on acceptable odor standards and odor reduction expectations by inviting “odor experts” to address some of the meetings.

For more information, contact:

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