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Loud Lab LLC
4817 NE 107th
Portland, OR 97220

Attention: Eric Shoemaker

5/10/16

Re: Hazardous Materials and Process Technical Opinion and Report, Rev. 3

Dear Eric,

Following is a Hazardous Materials Technical Opinion and Report, rev. 3, as requested by you as relates to hazardous materials storage and use at the existing Loud Lab facility. This facility is located at 4817 NE 107th Ave. in Portland. This revised Report reflects comments and a meeting with the City of Portland on May 6.

Discussion: Facility

Loud Lab operates a closed-loop hydrocarbon extraction facility, together with related packaging, distribution, and office uses. The primary business is the manufacture and wholesale distribution of cannabis extracts and related products. This facility has applied for both medical and recreational processing licenses as administered by the Oregon Health Authority (OHA) and Oregon Liquor Control Commission (OLCC) respectively.

The facility occupies a 10,000 SF two-story building, zoned CG, located at 4817 NE 107th Ave. The bottom floor is used for the extraction and processing of cannabis and should be properly classified as an F1 occupancy. The upstairs is office space and should be classified as a B occupancy. The entire facility is protected by sprinklers - a wet system for the interior and a dry system for the exterior. The Extraction Room shall comprise a Control Area as defined by the Oregon Codes due to the 1-hour fire barrier fully enclosing the room.

Loud Lab has provided a list of hazardous materials with quantities for the processing area and has also added a few other hazardous materials that are used in other locations in the building. From a hazardous materials perspective, the entire building comprises one Control Area.

Process Description

All extraction takes place in a purpose-built Extraction Room located on the first floor. This room was constructed according to the best available guidance for similar facilities in CO and WA. It is approximately 200 SF in size, slab concrete with floor drains, fully enclosed by a 1 hour-fire barrier, sprinklered, and with a air intakes (2) (floor-level at opposite ends of the room) make-air system rated for 3000 CFM.

The extraction machines are engineered and custom-built with Swagelok components rated for tolerances that far exceed the parameters of daily operation. Loud Lab is in the process of commissioning (eg. 3rd party field evaluation) with a licensed mechanical engineer.

The extraction process begins by chilling the solvent (a propane/N-butane mix) tanks with dry ice. Once sufficiently chilled, the solvent is passed through a spool filled with cannabis, stripping out the essential oils. The solvent/oil mixture is then collected in a dewaxing chamber and chilled further. Once this solution hits the target temperature, it is passed over a filter that removes the fats and waxes from the essential oil. It is then passed into a collection chamber for separation. In the collection chamber, the solvent mixture is gradually warmed to 85 degrees F, (turning the solvent from liquid back to gas) and then is recovered back into the solvent tanks using a recovery pump. After the solvent is off-gased back into its original tank, the essential cannabis oils remain.

Once all solvent is recovered back into its storage tank, the collection chamber is opened and the cannabis extract is removed from the collection chamber and placed in low-temp vacuum ovens to further purge any residual solvents that may be left. The entire process involving the propane/N-butane mix is a “use-closed process” as defined in the OFC.

Oregon Code and OLCC Requirements

Issue	Safeguard Provided (Code Reference)	Comments
Fuel for Extraction	Must be 99% pure (OLCC Div. 25, Section 845-025-3260)	Complies
Fully Enclosed Extraction Room	1-hour fire barrier (OSSC 414.2 for Control Areas)	inferred by OLCC ; must complete with 1-hour ceiling and door
Proper Ventilation in Extraction Room	1cfm/sf as a minimum (OFC 5307.2, 5004.3, OSSC 414.3)	Complies. 3000 cfm rated system with explosion proof fan
Control of Ignition Sources in Extraction Room	Remove all sources of ignition; Class 1, Division 2 within Extraction Room (OFC Table 5703.1.1)	In process. All pumps are spark resistant. Still need spark resistant outlets and backup power
Flammable Gas Detection in Extraction Room	Approved LEL detector with visible/audible alarm backed by battery (OFC 5001.3.3.8, OSSC 414.5.2)	In process. LEL detector installed, but still need battery backup.

Issue	Safeguard Provided (Code Reference)	Comments
Closed-loop Extraction System	Approved third party approval required (OFC 5003.2)	In process. Currently pursuing engineering report.
Equipment and Facilities Approved for Use	By local Fire Official (OLCC Div. 25, Section 845-025-3260)	In process. Use is allowed under zoning and occupancy for this building. Local Fire Marshall has toured facility, with follow up communications. State licenses and COs pending.
Emergency Eyewash	Within 25' of operations (Oregon OSHA, OLCC Div. 25, Section 845-025-3260)	Partially complete. One more eyewash station needed.
Safety Data Sheets (SDS) Available	Available on-site (OFC 5003.4)	Complies. SDSs provided by 3 rd party vendors are posted in facility.

Hazardous Materials Findings

Miller Safety & Health Consulting used SDSs provided by Loud Lab and the database HMEX to review all of the materials to be stored and used at the facility. Following are the findings as relates to the HMIS prepared for the proposed facility.

There are no exceedences of the Maximum Allowable Quantity (MAQ) for Storage or Use in the Extraction Room. See the attached HMIS Classifications and Summaries for details.

Conclusions, Recommendations and Requirements

1. The Loud Lab facility complies with the MAQ amounts allowing the Extraction Room to be classified as a non-High Hazard facility, F1 occupancy.
2. The International Fire Code Chapter 50, applicable Sections 5001 and 5003, apply to the storage and use of hazardous materials regardless of the amount or occupancy. Among these requirements are:
 - a. Proper labeling and signage

- b. SDSs for all hazardous materials
 - c. A storage plan, if so requested by the Fire Department, showing types of hazardous materials and locations in tanks and on shelving.
 - d. **Written procedures and personnel training** as relates to hazardous materials.
- 3. It will be the responsibility of Loud Lab to maintain hazardous materials amounts within the MAQ. If the MAQ Amounts are exceeded at any time the Extraction Room would be classified as H occupancy requiring many additional engineering and administrative controls per the Codes.
 - 4. It will be the responsibility of Loud Lab to maintain the overall facility in accordance with the requirements of the Oregon Codes, OHA, OLCC, and industry standard Best Management Practices.
 - 5. If Approved Cabinets are used in the future to increase the MAQ amounts, these cabinets must comply with UL 1275 and be constructed of materials compatible with the hazardous materials stored. Doors must be self-closing and self-latching. New Cabinets should have the UL Listing clearly displayed.

It has been a pleasure working with you. Please contact me if you have any questions concerning this Report. Please remember to include the attachments as noted below along with of this Report.

Sincerely,

A handwritten signature in black ink, appearing to read "Richard M. Miller".

Richard M. Miller, C.S.P.
ICC Certified Fire Code Inspector II

Attachments: HMIS, Summaries and Explanation Sheet (4 pages)