	Plant Extraction Systems for Commercial/Licensed Facilities		510-925
	AUTHORED BY: Life Safety Chief Ty Drage	EFFECTIVE DATE: 10/01/2017	
APPROVED BY: Fire Chief Ron Bateman	REVISION DATE: Scheduled 01/01/2019		

Information in this policy is provided to clarify how the adopted International Fire Code applies to plant extraction processes and equipment at commercial facilities licensed and permitted by Front Range Fire Rescue and the local municipality. All types of plant extraction processes are strictly prohibited within residential buildings. Because every process and building differs, this policy is not intended to identify or discuss every possible code requirement applicable, and it is not intended to be an all-inclusive regulatory document. Therefore, it is the responsibility of the person(s) performing these processes and/or otherwise responsible for the design or construction of extraction rooms, equipment, and operations to follow all applicable codes and standards. If applicable codes and standards have not been specifically established by Front Range Fire Rescue or the local municipality, or are not specifically addressed by the adopted International Fire Code, then the current codes and standards of the City and County of Denver shall apply.

Owners and operators, along with their employees, agents, and assigns, assume all risks arising from or related to the operation or maintenance of a marijuana and/or hemp facility. Front Range Fire Rescue assumes no liability for any such operation or maintenance through the adoption and enforcement of this policy.

Scope:

This policy is intended to provide basic information based on currently available information regarding marijuana and other plant extraction processes for most common conditions and situations. Plant extraction is strictly prohibited within residential buildings. In any given occupancy, many other Fire and Building Code requirements may be enforced. This policy addresses the safety requirements pertaining to the use of plant extraction systems within the Front Range Fire Rescue response area. These include systems designed to extract plant material using flammable gases, flammable liquids, carbon dioxide, alcohol, and/or any other method of plant oil extraction.

Exemption: Extraction processes using cold water only.

Requirements of Other Jurisdictions:

Planning, zoning, and/or construction permits from the local municipal entity shall be obtained by the applicant prior to any work commencing. All work associated with extraction processes and equipment shall be inspected prior to the issuance of the Plant Extraction operational permit. Refer to the Front Range Fire Rescue policy for Construction Permitting for Marijuana & Hemp Establishments or Businesses for specific requirements related to Front Range Fire Rescue review of extraction processes and equipment.

All marijuana and hemp occupancies within the Front Range Fire Rescue jurisdiction are required to obtain and maintain a Marijuana/Hemp Establishment or Business operational permit from Front Range Fire Rescue. Where hazardous material storage amounts reach or exceed amounts requiring a permit per the adopted International Fire Code, then one or more separate hazardous materials operational permit(s) is also required to be obtained and maintained.

If applicable codes and standards have not been specifically established by Front Range Fire Rescue or the local municipality, or are not specifically addressed by the adopted International Fire Code, then the current codes and standards of the City and County of Denver shall apply.

Permits:

Construction permits shall be obtained from the municipality within which the facility is located, as well as from Front Range Fire Rescue, prior to the implementation of any extraction process.

An annual operational permit shall be obtained from Front Range Fire Rescue for any extraction process not exempted in the scope of this policy. All annual operational permits shall be maintained on site and available for inspection at all times. To obtain a permit, the following information shall be provided:

- Property owner name, phone number, fax number, physical residence address
- Business owner name, phone number, fax number, physical residence address
- Site address
- 24-hour contact name and phone number
- Installation/maintenance contractor's business name, address, phone number and fax number
- List each type of business proposed
- List each type of process proposed
- List the type of machine used in the process
- Provide complete documentation of the technical specifications on any machine or safety equipment proposed for use (i.e., extraction devices, hood systems, etc.)
- Provide documentation that each piece of proposed equipment has been approved by the Denver Fire Department
- List total cubic feet, or equivalent solid pounds, or equivalent gallons of gas or liquid, on site, including all inside and outside storage and/or use.
- Provide an architectural quality to-scale diagram of the site location, including all property lines, walls, doors, windows, ventilation systems. The specific use of each room shall be noted, including any gas and/or liquid use or storage areas.
- Provide detailed specifications of any automatic fire suppression system, fire alarm system, local hydrocarbon, carbon dioxide or other hazardous material detector provided for the building.

Extraction equipment, including equipment used for winterization or other oil refining processes, that use hazardous materials (i.e., flammable/combustible liquids, carbon dioxide (CO₂), liquefied petroleum gases, butanes, etc.) are required to be *listed* or be approved by the Denver Fire Department. Any costs associated with obtaining Denver Fire Department approval shall be the responsibility of the applicant.

To obtain the required permit(s), the business owner or company representative shall complete and sign the Extraction System Permit application form and provide all other required documentation. Separate permits will be required for use and storage of flammable gases, LPG, or flammable liquids. A compressed gas permit will be required for carbon dioxide use and storage in amounts over 100 pounds. All extraction processes, except as exempted by this policy, will need to receive a technical plan review by Front Range Fire Rescue and may require a third party technical review. The applicant shall be responsible for all costs associated with third party technical review or other involvement.

Permit Fees:

All permit fees are the responsibility of the applicant, including any fees associated with reviews or inspections completed or performed by third party entities.

Refer to the Front Range Fire Rescue Plan Review and Permit Fee Schedule for current permits and associated fees.

Part 1 – Extraction Process Equipment:

Extraction equipment, including equipment used for winterization or other oil refining processes, that use hazardous materials (i.e., flammable/combustible liquids, carbon dioxide (CO₂), liquefied petroleum gases, butanes, etc.) are required to be *listed* or be approved by the Denver Fire Department. Any costs associated with obtaining Denver Fire Department approval shall be the responsibility of the applicant. Refer to the Denver Fire Department's *Extractor Approval List* on the Denver Fire Department's website for a list of manufacturers with approved equipment.

A. Liquefied Petroleum Gas, Butane, and CO₂ Extraction Equipment

Only closed-loop type extraction equipment is permitted. Open blasting extractions or equipment that releases vapor to the atmosphere during the extraction process is strictly prohibited. Open-blast LPG extractions are prohibited. Thus far, only closed-loop LPG (i.e., propane or butane) systems that have been designed to applicable sections of NFPA 58 have been approved.

Because there is currently no listing (i.e., UL, ETL, FM, etc) available for compressed gas extraction system using hazardous materials, only extraction equipment that has been approved by the Denver Fire Department shall be used within the Front Range Fire Rescue response area. Equipment that is not approved for use within the City and County of Denver shall not be installed, used, or operated within Front Range Fire Rescue jurisdiction.

To obtain Front Range Fire Rescue approval of equipment, the applicant shall submit an engineering reporting, signed and sealed by a licensed Colorado professional engineer, for review and approval. This submittal shall also include an analysis/description of every component of the system, its intended installation location in the building, and the official equipment approval notification from the Denver Fire Department and any design and/or

installation requirements of DFD. It is the responsibility of the applicant to provide sufficient proof of Denver Fire Department approval of the equipment.

In addition to the engineering report, an owner's operation manual shall be submitted with specific instructions regarding proper installation and use of the equipment and any safety provisions identified. Engineering reports may be submitted in hard copy, signed and sealed by the licensed design professional to Front Range Fire Rescue. Any costs associated with obtaining Denver Fire Department approval shall be the responsibility of the applicant.

In addition to this engineering report approval process, if the extraction equipment uses electrical components, a National Recognized Testing Laboratory (NRTL) listing is also required in addition to the engineering report certifying that the electrical components are compliant with appropriate electrical standards.

After FRFR approval of the specific extraction equipment, it may be installed in the specific location identified within the submitted engineering documents and in accordance with manufacturer installation instructions. Each piece of equipment shall be identified by serial number and specific location. Once the equipment installation is approved by Front Range Fire Rescue and all other extraction room safety provisions have been met, a Plant Extraction Systems Operational Permit may be issued for final approval of the extraction equipment and continued use. Any modification of the equipment or moving the equipment to a different location shall immediately void the equipment approval and any associated permit.

B. Flammable Liquid

There are numerous methods for performing distillation or evaporative extraction/refinement processes. In general, electrified equipment used in these processes is required to be listed by a NRTL for their intended use and is required to be operated within the manufacturer's guidelines. Equipment such as rotary evaporators are typically listed for distillation processes. Where distillation stills or heated evaporative processes are performed, the heating source shall be listed as explosive-proof (i.e., rated for the electrically classified location) unless it can be shown that the equipment has been tested during its listing to heat flammable liquids without the explosion-proof classification. Request for approval of the proposed process equipment shall be submitted to Front Range Fire Rescue for review prior to installation and/or use and shall include any engineering reports necessary to confirm that the equipment and installation comply with the adopted Building and Fire Codes.

C. Vacuum Ovens

Vacuum ovens shall not be used to process volatile gases (i.e., alcohol/oil mixtures, oil containing off-gassing LPG, other flammable liquids, etc.) unless the vacuum oven is rated to process these vapors (typically an explosion-proof classification). It is the responsibility of the extraction process operator to ensure the material being introduced into the oven does not contain volatiles. All vacuum ovens shall be listed by a NRTL.

D. Refrigerators

Refrigerated storage or processing of flammable liquids, including oils that are laden with flammable liquids, must only refrigerators/freezers that are rated to store flammable liquids. At minimum, a “Lab-Safe” or “Flammable Safe” rated refrigerator/freezer shall be used. Residential type refrigerators/freezers are not rated by the manufacturer for flammable liquid storage or processing. See NFPA 45 for further information regarding refrigerators used for flammable liquid storage.

Part 2 – Extraction Room Construction, Gas Detection, Exhaust and Electrical Systems:

Extraction equipment, including equipment used for winterization or other oil refining processes, that use hazardous materials (i.e., flammable/combustible liquids, carbon dioxide (CO₂), liquefied petroleum gases, butanes, etc.) are required to be *listed* or be approved by the Denver Fire Department. Any costs associated with obtaining Denver Fire Department approval shall be the responsibility of the applicant.

A. Room Construction

Extraction processes are required to be located in a room dedicated to the extraction process. There shall be no other equipment within the room (i.e., refrigerators, freezers, cooking appliances, electrical panels, computers, cell phones, etc.) that is not specifically associated with the extraction process. Additionally, there shall be no penetrations into the room that are not essential to the extraction process (i.e., gas lines, HVAC systems, plumbing, etc.)

Rooms shall be of continuous, non-combustible, and smooth construction, and room finish shall also consider Health Department requirements for cleaning purposes. Booths manufactured in compliance with flammable finish requirements of the adopted Building and Fire Code may be accepted as meeting these construction requirements. Acoustic-type drop ceilings that could conflict with large LPG extraction exhaust systems will not be permitted. Hand sinks and eye wash stations (if required by other Codes) may be located within the room.

Doors to extraction rooms using hazardous materials (i.e., CO₂, LPG, or flammable liquids) shall swing in the direction of egress, be self-closing/self-latching, and be provided with panic hardware.

Post-oil processing typically uses small volumes of flammable liquids and may be performed outside of a dedicated extraction room. This process can typically be performed under a bench-top chemical fume hood.

B. Suppression Systems

An LPG extraction room, booth, or hood is required to be provided with an automatic fire suppression system in accordance with adopted International Fire Code. A suppression system is also required in a flammable liquid extraction room, booth, or hood where vapors are released exceeding 25% of lower flammable limit (LFL). No suppression systems are required in CO₂ extraction rooms. Where the building is required to be sprinklered, the sprinkler system shall be

extended to the room, booth, or hood. Where the building is not required to be sprinklered, an alternative suppression system shall be provided in accordance with the adopted International Fire Code.

These extraction room requirements are not applicable to water extractions, kief production rooms, food-based extractions, or other extraction processes that do not use hazardous materials.

C. LPG Extraction Process Gas Detection System

There are two forms of flammable gas detection required in LPG extraction areas: a fixed continuous flammable gas detector servicing the room, hood, or booth and a portable flammable gas detector. The intent of each of these gas detection systems with the LPG extraction area is twofold: for alerting the extraction process operator(s) that the area is at or above 10% of the lower flammable limit (LFL) and for the extraction process operator(s) to specifically identify potential leaks during the extraction process and additionally to determine when oil and/or spent plant material is finished off-gassing and is safe to be removed from the extraction area.

The fixed detector shall be installed in accordance with the manufacturer guidelines. Depending on the size and configuration of the room, booth, or hood, additional detectors may be required. The fixed detection alarm shall be a local alarm only and does not require off-site monitoring or full occupant notification of the building or extraction room (including ADA visual notification) as a fire alarm system may require. Fixed detection shall alarm at 10% of the lower flammable limit (LFL). The method of alerting the extraction operator (audible/visual notification) is based on the type of the gas detector selected. Some detectors have integrated visual alarms only that may be accepted when installed within clear view of the extraction operator (i.e., at eye level within the sensor extended to the floor). Otherwise, a remote visual or audible local alarm may be accepted.

D. LPG Extraction Exhaust Systems

A hazardous exhaust system is required to be installed in accordance with the International Mechanical Code for extraction processes that use LPG. There are many different ways to design a hazardous exhaust system including fume hoods, walk-in hoods, booths, and exhausted rooms. There are manufacturers of booths and hoods that meet this requirement in a complete off-the-shelf package. Exhaust systems can also be built specifically to suit the needs of a location or process; however, no one system is dictated by the adopted Fire Code. The engineer of record shall design and/or specify a system to meet the minimum requirements of a hazardous exhaust system.

The intent of the exhaust system is to be designed with capture and containment velocities across the work area, as described in the International Mechanical Code, as is typically seen with other industrial or laboratory processing using hazardous materials. There are several work areas that must be considered in this design and may be different for each extraction equipment manufacturer. The extraction process equipment location, the location of oil retrieval, and the

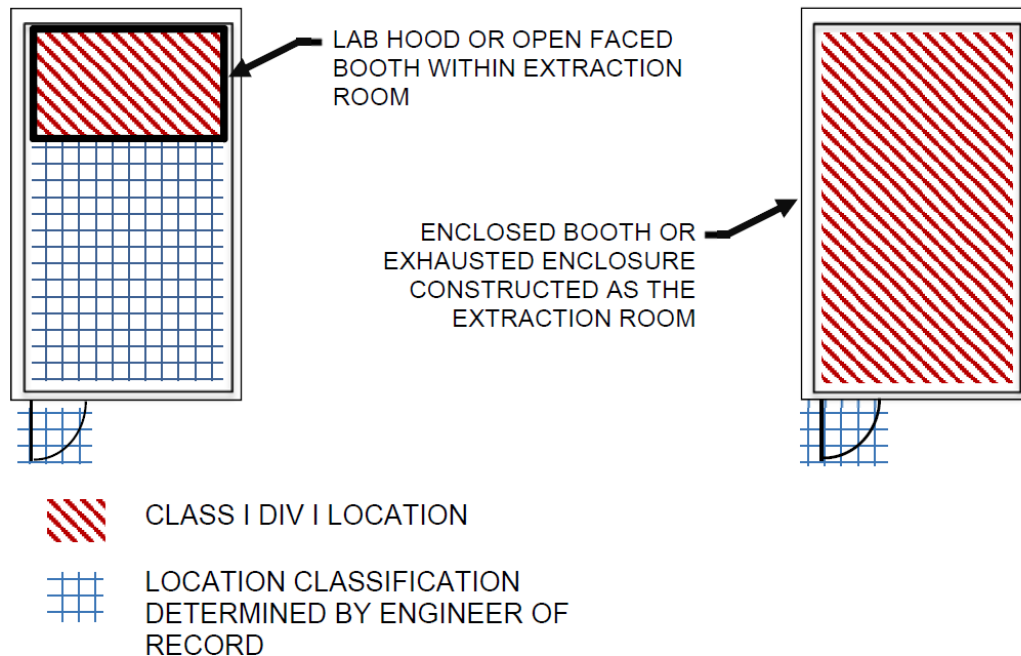
location of LPG-laden plant material removed from the extraction equipment for degassing are all work areas that are intended to be provided with exhaust system capture and containment velocities. The assumption that a “closed loop” system does not release LPG into the atmosphere will not be accepted as a basis in the design of these exhaust systems, since all extraction systems must be opened at some point in the process with resultant vapor release. It is recommended that the ACGIH Industrial Ventilation Handbook be consulted for exhaust system and capture/containment velocities.

E. LPG Extraction Electrical Systems

The location of the LPG extraction process shall be considered a Class 1/Division 1 location in accordance with the National Electric Code (NEC). Depending on the type of exhaust system provided, this classification may be the entire room or the area inside of a hood or booth. The Class 1/Division 1 requirement was established by Denver Fire Department’s observation and flammable gas metering of several extraction processes, all of which exceeded minimum LFLs during equipment opening for oil retrieval and removal of LPG-laden plant material, in addition to other known equipment and accidental process failures resulting in the release of LPG. Flammable gases are present during normal extraction operations, therefore this location meets the NEC definition of a Class 1/Division 1 location.

The location adjacent to the Class 1/Division 1 location (i.e., doors to the extraction room, hoods opening into the extraction room, etc.) shall be classified by the design engineer. The classification of these locations is dependent on the type of exhaust system provided and the room configuration. Normally, adjacent locations are Class 1/Division 2; however, the NEC does not define a required distance that an “adjacent location” must be from the Class 1/Division 1 location in order to be classified as a Class 1/Division 2 location. The NEC defines Class 1/Division 2 as a location where flammable vapors could be present from accidental rupture or breakdown of containers. Therefore, this classified location should be established based on a total extraction equipment failure. This classification has been intentionally left to the determination of the responsible engineer since many factors can influence this area, such as mechanical exhaust sizing, total LPG within the extraction equipment, etc.

Typical LPG exhaust types and the associated NEC location classification is illustrated below.



Based on the Class 1/Division 1 location, all equipment in the extraction room shall be rated for use in Class 1/Division 1 locations. This includes lighting, power receptacles, vacuum pumps, recovery pumps, and any other electrical equipment in the room. The need for explosion-proof rated equipment can be minimized. Lighting located behind a vapor-tight glazing panel outside of the extraction room/booth is not required to be classified as Class 1/Division 1. This concept is similar to flammable finish spray booth lighting systems.

Other extraction process support systems such as air compressors to drive recovery pumps, heated/chilled water circulation pumps, vacuum air systems, etc. can all be located outside of the Class 1/Division 1 location and piped into the process area. Where electrical equipment is needed, it must be rated for the Class 1 location where it is installed.

To reduce the possibility of a spark from static discharge, all metal objects including ductwork, hand sinks, water piping, etc. shall be grounded/bonded in accordance with the NEC. This will also require the extraction equipment to be grounded/bonded.

The room lighting and room power receptacles (where provided) are required to be interlocked with the exhaust system such that the room power and lighting will not operate without the exhaust system running. Power serving room flammable gas detectors is not required to be part of this interlock requirement.

F. Flammable Liquid Extraction and Post-Oil Processing Gas Detection Systems

None required.

G. Flammable Liquid Extraction and Post-Oil Processing Exhaust Systems

For the purposes of this section, exhaust system requirements for extraction processes using flammable liquids are also required for post oil processing using flammable liquids. Post oil processing is an oil refining or winterization process occurring after the initial extraction is completed.

There are many different methods available to perform flammable liquid extractions as well as a variety of equipment available; therefore, all processes cannot be described in detail within this policy. Generally, these processes can be grouped into two categories: distillation extractions where most of the flammable solvent is recollected OR a heated boil-off (evaporative) process where flammable liquid is evaporated to the atmosphere without recollection.

A hazardous exhaust system that complies with International Mechanical Code is required for flammable liquid processes exceeding five (5) gallons. These typically include boil/evaporative processes, distillation processes, and flammable liquid plant wash processes. This exhaust system is intended for larger processes where dispensing of flammable liquids also occurs in greater volumes, flammable liquid laden plant material is removed from equipment, and/or vapors are present from heated extraction processes. The exhaust system must provide capture and containment velocity across the work area per the International Mechanical Code and is typically provided in the form of a standard lab-type exhaust hood. It is suggested the ACGIH Industrial Ventilation Handbook be consulted for exhaust system and capture velocity design.

Distillation processes using less than five (5) gallons shall be performed under a chemical fume hood designed to contain fumes within the hood and exhaust them to the exterior. This system does not have the duct gauge thickness and other requirements of a full hazardous exhaust system. This exhaust system is typically for smaller bench-top types of distillations and also for dispensing small volumes of flammable liquids.

H. Flammable Liquid Extraction and Post-Oil Processing Electrical Systems

For rooms, booths, or hoods containing flammable liquid extraction or post oil processes, the electrical location classification shall be specified by the responsible licensed design professional. It is expected that this classification is included on building permit drawings and that supporting information is submitted justifying how the location classification was determined. Because there are numerous methods of performing flammable liquid extractions, the process must be evaluated and the classification determined must be established by the licensed design professional. Note that the licensed design professional must consider not only the process equipment, but also the dispensing (i.e., filling and removal) of flammable liquids, soaking (i.e., plant wash) material in open containers, and the removal of plant material saturated with flammable liquids, because all of these operations may have an impact on the location classification.

Also refer to Section 1-B of this document for further information.

I. Carbon Dioxide (CO₂) Extraction Process Gas Detection Systems

A fixed continuous CO₂ detection system is required within CO₂ extraction rooms, set to alarm at 5,000 ppm. This system is a local alarm only and is not required to be monitored off-site. The system is intended to alert the extraction operator of a potential asphyxiation hazard. There is no requirement to alarm the building or to have ADA-compliant visual notification as is typically required for fire alarm systems.

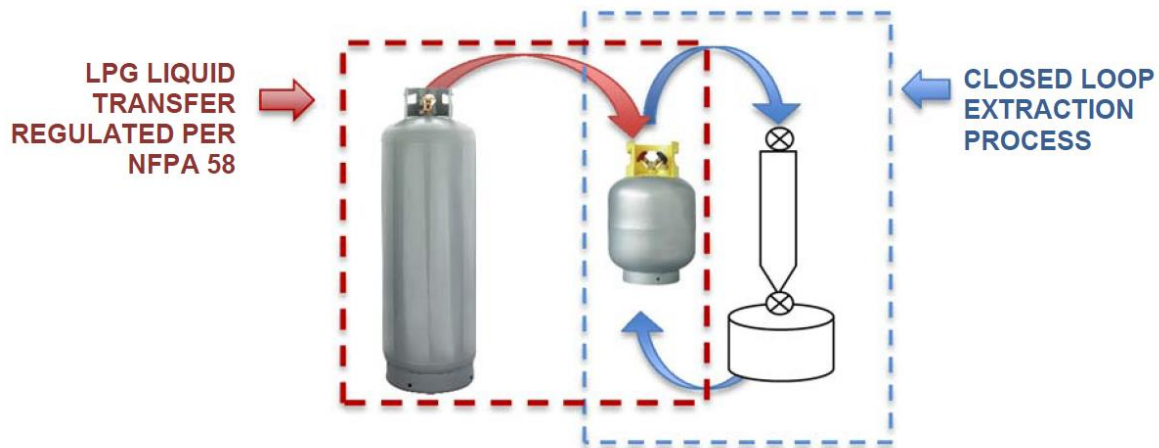
J. Carbon Dioxide (CO₂) Extraction Exhaust Systems and Electrical Systems

CO₂ extraction equipment is required to have releases of CO₂ piped to the exterior. Stored CO₂ cylinders shall be secured to a fixed object to prevent falling. Refer to the compressed gas policy for additional storage requirements.

Part 3 – Filling LPG Extraction Equipment:

Extraction equipment, including equipment used for winterization or other oil refining processes, that use hazardous materials (i.e., flammable/combustible liquids, carbon dioxide (CO₂), liquefied petroleum gases, butanes, etc.) are required to be *listed* or be approved per the adopted Denver Fire Code. Any costs associated with obtaining Denver Fire Department approval shall be the responsibility of the applicant.

Although manufacturers may use different terminology, extraction equipment includes an LPG solvent tank (i.e., a local system supply tank) which is filled with LPG and supplies the extraction equipment. This same tank is also used to reclaim LPG after the extraction. The approval for closed-loop LPG extraction equipment discussed in Part 1 of this document approves only the closed-loop system. Filling the LPG solvent tank from a bulk tank (typically a 100-pound or larger tank) is not included in the approval of extraction equipment and is regulated per NFPA 58 as LPG liquid transfer. This process is depicted below:



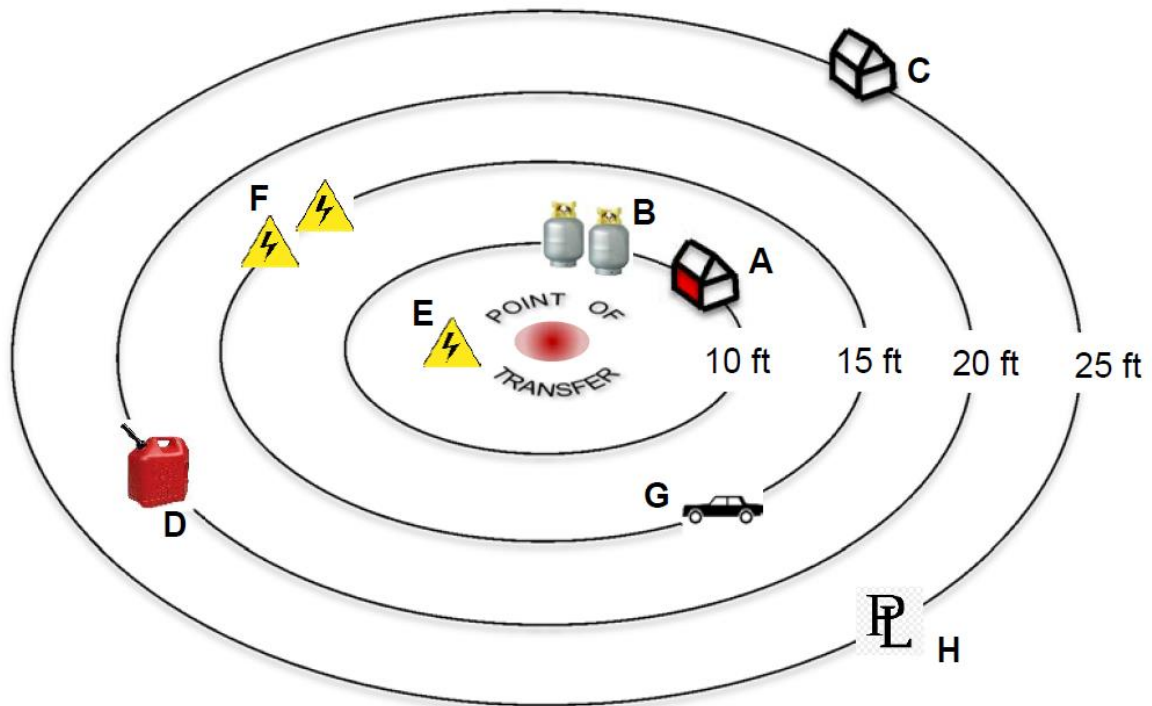
Filling the solvent tank (i.e., transfilling) is regulated as LPG liquid transfer under NFPA 58 and must be conducted outdoors. Indoor filling and/or indoor filling from piped LPG liquid systems may be conducted where the room and process has been designed in accordance with NFPA 58, notable Chapter 10. The requirements of NFPA 58, Chapter 10, are stringent and will not be discussed within this document due to their complexity. Where performed, this process is included in the Plant Extraction Systems operational permit that may be issued by Front Range Fire Rescue. Information on LPG liquid transfer processes must be included at the time of initial permit application.

LPG liquid transfers using lighter refill-type containers using can taps or other puncture equipment is prohibited.

The following is a summary of some of the requirements from NFPA 58:

- a. Personnel conducting liquid transfer operations shall be trained in LPG filling with three (3) year recertification. Documentation of initial training and all recertifications shall be maintained by the employer throughout the individual's employment.
- b. Public access to the filling location shall be restricted.
- c. The filling location shall be located at least 15 feet from combustion engine use (i.e., vehicle parking area, drive aisle). All ignition sources shall be shut off. The location may be against a noncombustible building wall without openings.
- d. Electrical equipment shall be Class 1/Division 1 within five (5) feet of filling operations and Class 1/Division 2 within 15 feet of filling operations.
- e. Where heating blankets are used, they must be listed for use in explosive environments. A municipal electrical permit is required for any circuits being extended to the filling location.
- f. Where scales are used for weighing containers, they shall be Class 1/Division 1 classified or shall be of the mechanical type.
- g. Smoking, portable lighting, portable electric tools, etc. shall not be in used within 25 feet of the filling operation.
- h. Purging of tanks may be performed at the tank filling location in accordance with NFPA 58. The tank must be rapidly dispersed into the atmosphere. Where environmental conditions do not allow rapid dispersal (i.e., wind conditions, site conditions such as neighboring buildings on lot lines not allowing adequate natural ventilation, etc.), LPG must be flared using a method in compliance with NFPA 58 and based on a single-use permit issued by Front Range Fire Rescue.

The NFPA 58 separation distances from the transfilling location are described and illustrated below:



A – Buildings with one (1) hour fire rated exterior wall

B – LPG containers in storage

C – Buildings with non-fire rated exterior wall or with building openings

D – Flammable/combustible liquid storage

E – Class 1/Division 1 electrically classified area within five (5) feet of transfer

F – Class 1/Division 2 electrically classified area

G – Vehicle traffic

H – Property line that can be built upon

Site Inspection:

Upon approval of the extraction system and associated equipment, a permit will be issued and Front Range Fire Rescue will conduct a field inspection of the site. Front Range Fire Rescue may determine that a field inspection by a third party entity is required to confirm permit provisions and/or engineering approvals. The applicant shall be responsible for all costs associated with third party involvement.

Compliance with ALL fire code requirements shall be maintained at all times. Any issued permits shall be posted and available for inspection on site at all times. Permits are only valid for the specifically listed business/property owner, time frame, site address, and process as indicated on the permit. Permits will be revoked if:

1. Any of the conditions or limitations established on the permit has been violated.
2. Compliance with a written order has not been achieved.
3. False statements or misrepresentations of information are found to have been provided on the permit application.
4. The permit is issued in error or in violation of municipal ordinance or adopted Fire Code.

Specifics and Conditions:

Inspection and Testing of Equipment

All sensors, alarms, and storage containers shall be inspected and tested annually, or as prescribed by the manufacturer. A written record of all required inspection and testing shall be maintained on the premises for no less than three (3) years, or the life of the equipment, whichever is greater. Testing of emergency devices or systems required by Front Range Fire Rescue or the municipality shall be performed by persons trained, qualified, and licensed in these systems.

LPG (butane/propane) Related Extractions

- a. A LPG extraction process where gas is released directly to the atmosphere is prohibited.
- b. LPG extraction processes are prohibited in basements unless an approved hazardous exhaust system is provided and maintained.
- c. Hazardous exhaust systems shall be in operation at all times during the extraction process. Where interlocks are not provided for fan operation to ensure operation, signage shall be posted at the switch indicating "EXHAUST MUST BE IN OPERATION DURING EXTRACTION PROCESS."
- d. Local hydrocarbon detector/alarm shall be in operation at all times during the extraction process.
- e. Extraction equipment shall not be operated near open flame or spark producing appliances.

Flammable Liquid Related Extractions (distillation/boil off)

- a. Flammable liquid extraction processes are prohibited in basements unless an approved hazardous exhaust system is provided and maintained and the basement has an approved automatic fire suppression system installed.
- b. Hazardous exhaust systems shall be in operation at all times during the extraction process unless the extraction equipment is UL listed as a Solvent Recovery Unit. Where interlocks are not provided for fan operation to ensure operation, signage shall be posted at the switch indicating "EXHAUST MUST BE IN OPERATION DURING EXTRACTION PROCESS."
- c. Extraction equipment shall not be operated near open flame or spark producing appliances.
- d. Open boil off extractions shall only utilize equipment (i.e., hot plates) rated for explosive atmospheres.
- e. Equipment shall be installed and operated strictly in accordance with manufacturer instructions.

Supercritical Carbon Dioxide Extractions

- a. Local carbon dioxide detector/alarm shall be in operation at all times during the extraction process.
- b. Carbon dioxide extraction equipment shall not vent indoors. Any process relief piping shall be piped to the outdoors

Training

All employees shall receive annual training in hazard identification, physical properties and emergency procedures. Training records shall be maintained and available for inspection at all times.

Revision History:

08/03/2017 Original documented developed

References:

Denver Fire Department – Marijuana Extraction Guideline for Commercial/Licensed Facilities
Denver Fire Department – Plant Extraction Systems

FRONT RANGE FIRE RESCUE

EXTRACTION PROCESS PERMIT APPLICATION

THIS FORM SHALL BE COMPLETED AND SIGNED BY A REPRESENTATIVE OF THE PROPERTY (SITE) APPLYING FOR THE PERMIT(S). IT SHALL BE RETURNED TO FRONT RANGE FIRE RESCUE WITH COMPLETE PLAN REVIEW APPLICATION FEE PAYMENT.

MAKES CHECKS PAYABLE TO FRONT RANGE FIRE RESCUE

NAME OF BUSINESS: _____

BUSINESS ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

PERMIT SITE ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

MANAGER/DIRECTOR NAME: _____

MANAGER/DIRECTOR PHONE: _____ EMAIL: _____

TYPE OF EXTRACTION PROPOSED EXTRACTION PROCESS (circle all applicable)

LPG

FLAMMABLE LIQUID

CO₂

OTHER

HAZARDOUS MATERIAL(S) USED IN EXTRACTION: _____

TOTAL AMOUNT OF HAZARDOUS MATERIALS STORED ON SITE: _____

Attach detailed hazardous materials inventory statement

NUMBER OF EXTRACTION UNITS IN OPERATION: _____

MANUFACTURER AND MODEL # OF EXTRACTION EQUIPMENT: _____

Attach applicable engineering approval(s) from Denver Fire Department

I, THE UNDERSIGNED, UNDERSTAND THAT FRONT RANGE FIRE RESCUE PERSONNEL WILL CONDUCT A SITE INSPECTION AND IF THE INSTALLATION DOES NOT COMPLY WITH THE ADOPTED INTERNATIONAL FIRE CODE AND AMENDMENTS THAT THE PERMIT MAY BE REVOKED WITHOUT A REFUND.

APPLICANT SIGNATURE: _____ DATE: _____