

Source Assessment and Removal

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Source Removal Issues

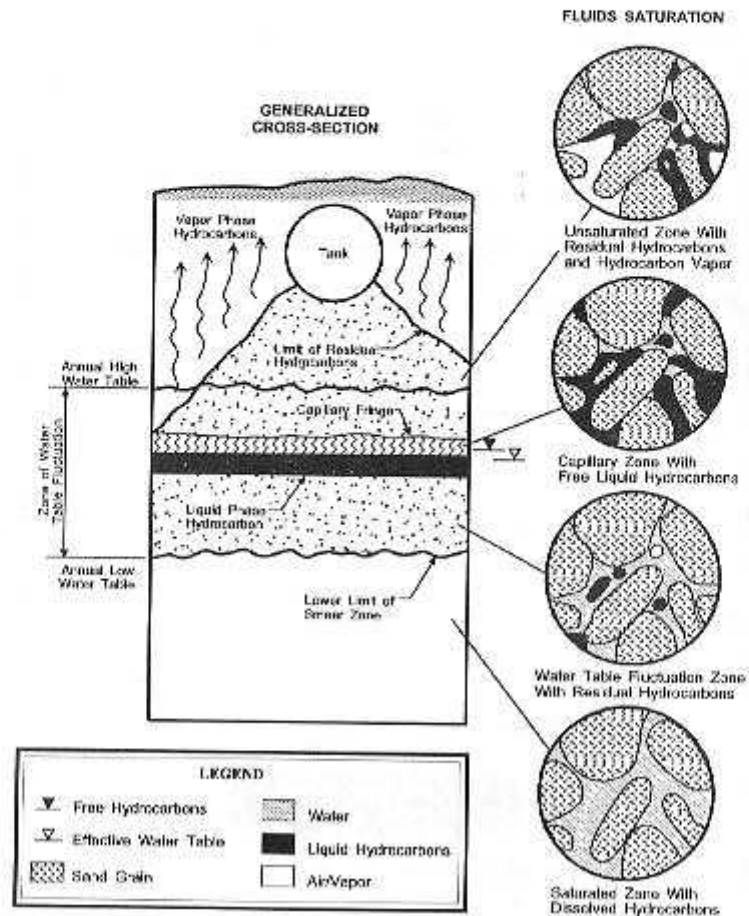
- Chapter 62-770 Procedures
- Preapproval Program Procedures
- Source Removal out of Priority Order
- Delay or Remedial Action for small discharges in exclusion zone

Source Mass Assessment and Removal

- What is meant by source mass?
- Free product, highly contaminated soil, smear zone
- Rule 62-770.300 provisions for “source removal”
- Immediate vicinity of the discharge
- Continues to release contamination till depleted unless physically removed

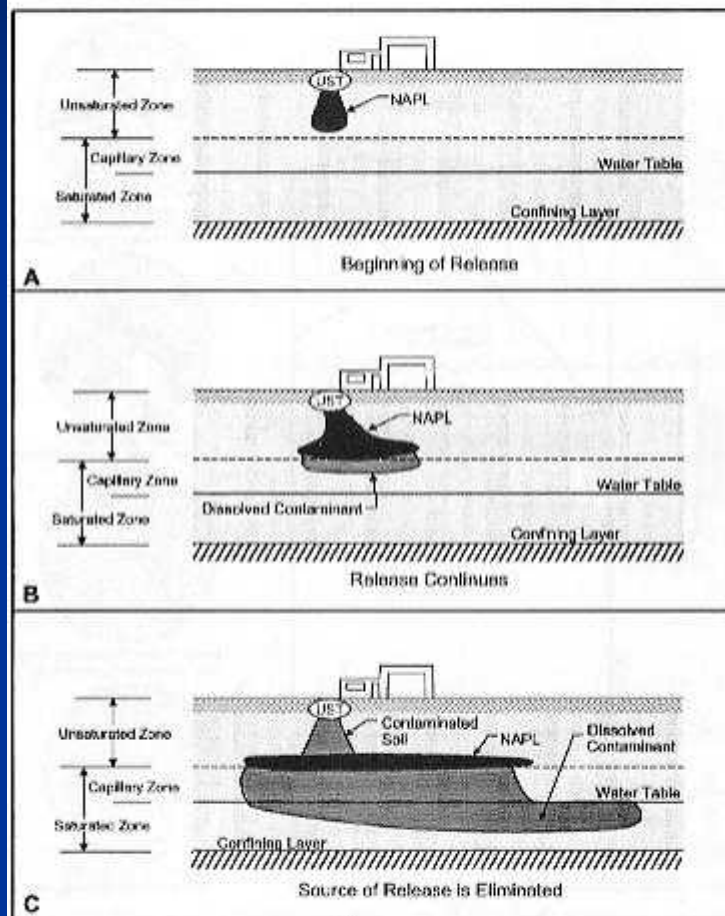
Exhibit III-2

Vertical Distribution Of Hydrocarbon Phases

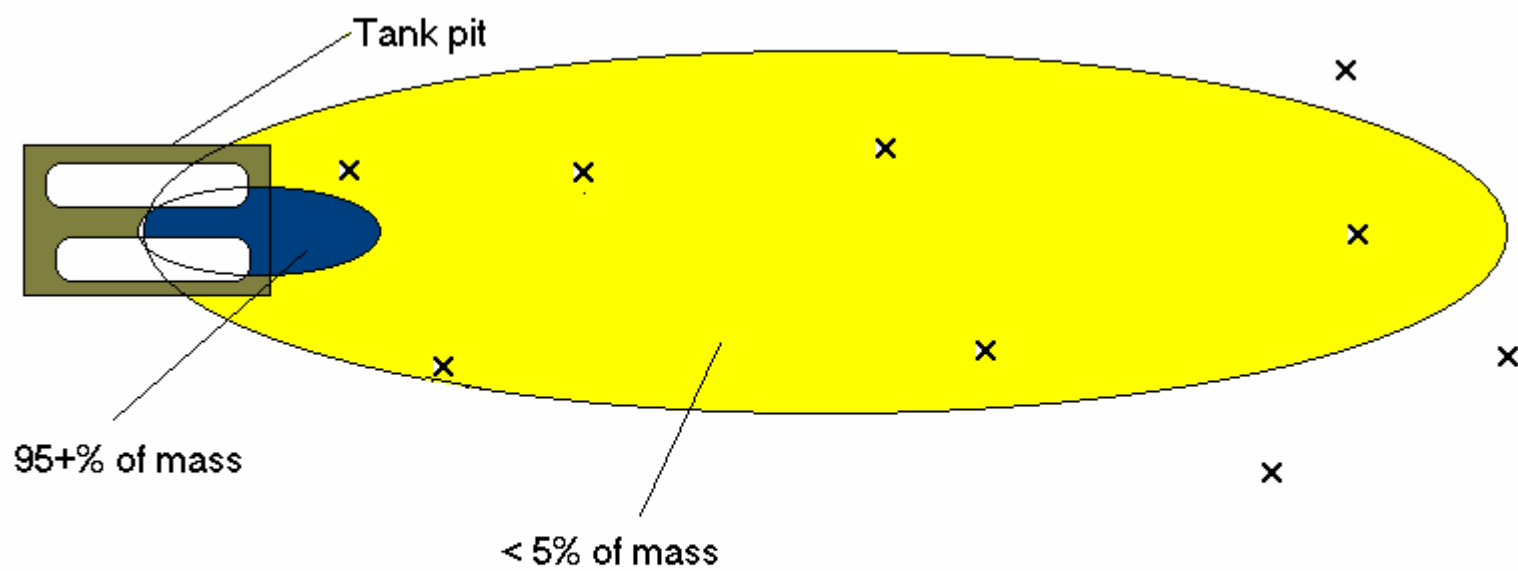


Source: Modified from Lundy and Gogel, 1988.

Progression Of A Typical Petroleum Product Release
From An Underground Storage Tank



Source: EPA, 1998



Benefits of Source Removal

- May significantly reduce timeframe of cleanup
- May significantly reduce cost of cleanup
- Immediate reduction of risk and contaminant migration potential
- May result in NAM finishing the job in reasonable timeframe with no other active remedial action

Rule 62-770.300

Interim Source Removal

- 62-770.300(1) - Free Product Removal and Disposal
- 62-770.300(2) – Short-term Groundwater Recovery - **NEW!**
- 62-770.300(3) – Soil Removal, Treatment, and Disposal

62-770.300(1) - Free Product Removal and Disposal

- Must initiate within 3 days of discovery (non-program sites)
- Do not spread contamination to previously uncontaminated or less contaminated areas
- Absorbent pads, skimmer pumps, hand or mechanical bailing
- Fluid vacuum techniques provided
 - Spreading or smearing of contamination avoided
 - Groundwater volume < 2X product volume, except for first 1,000 gallons

62-770.300(1) - Free Product Removal and Disposal

- The following additional methods may be used with prior authorization from FDEP or LP:
 - Excavation of soil saturated with petroleum products into or below the water table
 - Dewatering or groundwater extraction that may influence the water table depth
 - Air/fluid extraction techniques (multiphase extraction)

62-770.300(2) – Short-term Groundwater Recovery

- A short-term groundwater recovery event may be performed w/out prior approval provided:
 - Groundwater plume $< \frac{1}{4}$ acre in size & **confined** to surficial aquifer
 - Short-term pumping will likely qualify site for NAM or SRCO
 - Free product is not present
 - Pumping event limited to 30 consecutive days
 - Water hauled off site or discharged to sanitary sewer
 - Sample representative wells at least 30 days after completion of groundwater recovery

Short-term Groundwater Recovery

Supplemental Guidance

- When site assessment is submitted it must illustrate pre-pumping as well as post-pumping conditions of the groundwater plume
- Air/fluid extraction techniques which generate petroleum vapors may not be used
- Site assessment (SA) can be concluded with NAM proposal, or
- Subparagraph 62-770.600(4)(m)3. – one or two quarterly sampling events (> 30 days after pumping event) may be conducted to conclude SA with NFA Proposal

62-770.300(3) – Soil Removal, Treatment, and Disposal

- Do not spread contamination to previously uncontaminated or less contaminated areas
- VES may be used only if an imminent threat exists (24 hr notice of imminent threat to FDEP or LP)
- Proper stockpiling on liner and timely disposal of stockpiled soil
- Landfarming allowed in accordance with paragraph 62-770.300(3)(b)

Soil Removal, Treatment, and Disposal Supplemental Guidance

- Soil source removals may involve dewatering if limited in scope and duration to be incidental to removal of contaminated soil & smear zone soil
- No free product may be present
- NPDES Generic Permit in addition to containerizing for off-site disposal and sanitary sewer discharge
- No on-site treatment with discharge to groundwater without prior approval (RAP or Alternative Procedure)

Soil Removal, Treatment, and Disposal

Supplemental Guidance

- Pre-excavation soil contamination data with dewatering details must be presented in the Source Removal Report or Site Assessment Report to document dewatering that was conducted
- Sub-subparagraph 62-770.600(4)(m)3.a. – If groundwater contamination existed prior to the source removal - two quarterly sampling events may be conducted to conclude SA with NFA Proposal
- Sub-subparagraph 62-770.600(4)(m)3.b. – If groundwater contamination did not exist prior to the source removal – one sampling event may be conducted to conclude SA with NFA Proposal

Preapproval Program Source Removal Guidelines

- Last revised September 6, 2001 – currently under revision again (**stay tuned!**)
- Identifies necessary scope of evaluation necessary for justifying FDEP funded source removal actions with or without a RAP
- **Which items can be funded and which cannot**
- Addresses the timing of source removal or remedial action relative to facility upgrade
- Give consideration to either delay of remedial action or accelerate tank upgrade schedule
- 25% cost preference for source removal

Source Removal Considerations

- Need adequate and up-to-date soil assessment data
- Do not base decisions on “excessively contaminated soil” standard (obsolete) – SOIL ANALYTICAL DATA ARE REQUIRED
- OVA comparison – NOT correlation
- Consider depth to water table implications and historical variations
- Consider collecting soil samples from below the groundwater table for lab analysis (smear zone ID)
- Consider Level I closure options (alternative SCTLs)
- Define objectives of the source removal

Necessity for RAP Justification for Source Removal

- Site will qualify for NFA or NAM, and less than 200 cubic yards, and no non-cleanup benefits for owner - no RAP engineering evaluation necessary
- Greater than 200 CY, or site owner will receive non-cleanup benefits (e.g. – tank removal and/or replacement), or site will not qualify for NFA or NAM - LS RAP necessary

Necessity for RAP Justification for Source Removal

- FDEP will pay for screening and soil disposal only during a scheduled construction activity, and soil removal limited to construction scope. The site will not necessarily qualify for NFA or NAM as a result - no LS RAP needed
- Same as above but excavation will extend beyond construction activity scope and greater than 200 CY - need LS RAP

Necessity for RAP Justification for Source Removal

- Site improvements are imminent that will limit the ability to efficiently clean up the site (e.g. bldg. or road above source mass). No LS RAP needed if a description of the construction project, depiction of effect of source and soil contamination areas and evidence of commitment to the construction project is provided

Statutory Provisions Related to Source Removal Allowable Costs

- Section 376.3071(4)(c) - Rehabilitation of contamination sites ... **using the most cost-effective alternative** ... except that **nothing** herein shall be construed to authorize the **FDEP** to obligate funds for payment of costs which may be associated with, but are not integral to, site rehabilitation, such as the cost for retrofitting or replacing petroleum storage systems

Statutory Provisions Related to Source Removal Allowable Costs

- Section 376.3071(4)(j) - Activities related to removal and replacement of petroleum storage systems, **exclusive of costs of any tank, piping, dispensing unit, or related hardware**, if soil removal is preapproved as a component of site rehabilitation and requires removal of the tank ...
- Section 376.3071(4)(l) - Reasonable costs of **restoring property as nearly as practicable to the conditions which existed prior to** activities associated with contamination assessment or remedial action ...

Maxims of Source Removal

- No funding for tanks, dispensers, and integral piping hardware or related hardware
- No funding of significant remediation costs unless demonstrated to be cost-effective in an approved RAP (200 cubic yard limit)
- Funding is strictly limited to site rehabilitation activities unless other expenses are demonstrated to be “integral” to cost-effective site rehabilitation in an approved RAP
- The FDEP will not fund enhancements or improvements to previous site conditions during restoration

Supplemental Requirements to be Included in Revised Guidance

- If there is not a RAP or LS RAP, source removal allowable costs are limited to:
 - Excavation
 - Soil screening and disposal < 200 CY (planned)
- The following are not allowed if there is no RAP or LSRAP:
 - Dewatering
 - Tank removal and/or replacement
 - Site restoration, such as pavement replacement

Supplemental Requirements for Source Removals Justified in an Approved RAP

- All costs related to storage tank system removal and replacement & site restoration must be accurately disclosed in the RAP or will not be funded in the subsequent work order (items identified as well as accurate cost)
 - Items will be omitted from the work order, or
 - The RAP will be redone without FDEP funding

Supplemental Requirements for Source Removals Justified in an Approved RAP

- When tank removal and replacement is justified in approved RAP, FDEP participation is limited to equivalent capacity and installation in same location
 - Related costs prorated for larger tankage capacity
 - No excavation/dewatering expenses for installation in an alternative location
 - No other expenses allowable that would not otherwise be necessary to install same size and number of tanks in same location

Supplemental Requirements for Source Removals Justified in an Approved RAP

- Pavement restoration is limited to pavement that is removed or damaged to accomplish the source removal
- Type and quality of pavement should be equivalent to that which was removed
- Landscaping and other aesthetic items not allowable if not replacing what was removed to accomplish the source removal

Supplemental Requirements for Source Removals Justified in an Approved RAP

- The FDEP may pay to remove and reinstall the existing canopy if integral to the source removal
- If existing canopy cannot be reused due to building code or other reasons, the FDEP will not pay for a new canopy if that canopy would have been removed by 2010 to perform the storage tank system upgrade
- In such case the FDEP may pay to install the new canopy

Supplemental Requirements for Source Removals Justified in an Approved RAP

- The FDEP will not be responsible for the quality or oversight of the tank installation
- Site/facility owner will separately solicit bids for petroleum storage system installation and the FDEP will pay the amount of the low bid
- Site/facility owner must make arrangements for oversight of tank installation contractor. The FDEP will not compensate the preapproval contractor for oversight of petroleum storage system installation

Philosophy of source removal

“+25%” cost-effectiveness policy

- Soil source removal remediation strategies generally have more assurance of results and more reliable cost estimates
- Cleanup cost with installed remediation systems often is more than predicted
- Program-wide cost savings potential rationale to take precedence over individual site cost-effectiveness decisions

25 % cost-effectiveness preference

- Source removal can be selected over an in situ remediation alternative if up to 25% more costly on life cycle cost basis
- Must include comprehensive cleanup costs for all alternatives to achieve Site Rehabilitation Completion
- Use of preference is optional
- Consider site-specific variables affecting confidence in the in situ alternative outcome

Factors that affect effectiveness of in situ remediation

- Soil and aquifer characteristics
- Heterogeneity of lithology
- Confidence in source mass estimation
- Logistical impediments to strategic installation of in situ remediation system

25 % cost-effectiveness preference

- Accuracy and completeness of soil site assessment information is critical to use of this preference
- Higher frequency of soil samples for laboratory analyses is highly recommended
- Additional assessment costs will usually result in excavation savings many times over due to more strategic and effective soil source removal

25% incentive policy example

	Installed System	Source Removal
Construction	\$100,000	\$250,000
Annual O&M (year 1)	\$50,000	\$10,000 (RNA)
Annual O&M (year 2)	\$50,000	\$10,000
Annual O&M (year 3)	\$50,000	\$10,000
Total	\$250,000	\$280,000 (12 % higher cost)

Timing of Source Removal

- Delay initiation of remedial action to coincide with tank upgrade or a construction project
- Encourage owner to accelerate tank upgrade or the facility construction project
- Not a tank upgrade incentive initiative
- There must be a demonstration of a cost-effective cleanup benefit for the FDEP
- Mandatory RAP evaluation requirement

Timing of Source Removal

- Delays in implementing source removal should generally be proportional to the timeframe of the in situ remediation alternative
- Longer delays may be justified if proportionately greater cost saving result
- Cannot be used to justify delays of complying with the 12/31/09 tank upgrade deadline

Timing of Source Removal

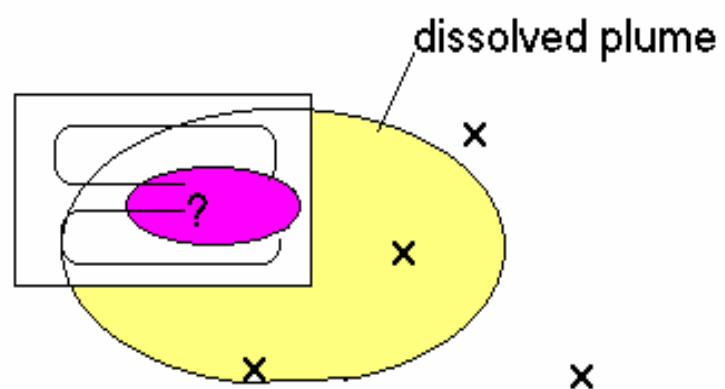
- Firm commitment to timeframe for tank upgrade or facility construction project
- Must not be any receptors impacted during the cleanup deferral
- Facility owner may benefit to a greater extent if tank upgrade or facility construction schedule is accelerated rather than to delay remedial action

Timing of Source Removal

- Can combine 25% cost-effectiveness preference for source removal with the process to delay remediation or accelerate tank upgrade
- Natural attenuation monitoring must be conducted during remediation deferral
- Procedures to notify “off-site” property owners

Practical Considerations for Small Source Removals

- Generally less than 100 cubic yards
- No “integral cost” considerations
- Soil analytical information may not be available (or necessary)
- Higher reliance on experience, intuition, and relative cost considerations



Small Source Removal Decision Example

- Site under RNA monitoring at \$10,000/yr
- Analytical information on original source area not available due to exclusion zone
- Tank upgrade proposed
- On-site oversight and possible soil removal of up to an estimated 100 tons proposed - Total projected cost - \$2,000 to \$10,000
- Relative cost considerations allow intuition and instinct to justify expenditure

LIMITED SOURCE REMOVAL INITIATIVE

- Out of priority order funding for limited source removals when done in conjunction with an early upgrade of USTs to meet secondary containment standards
- \$10,000,000 of annual funding will be reserved from the FDEP's Petroleum Cleanup Program for this activity
- Funding for any one facility is limited to no more than \$50,000 (up to \$100,000 with special justification)
- Maximum of 10 facilities per applicant, per fiscal year

LIMITED SOURCE REMOVAL INITIATIVE

- Soil laboratory analytical data or evidence that free product exists in the vicinity of the USTs needed to qualify
- Dewatering expenses can be included up to 10% of soil removal expenses
- Expenses only for soil removal activities; upgrade expenses are not included
- Allowable costs include:
 - supplemental soil assessment (justification needed)
 - contaminated soil transportation and disposal
 - backfill (material and transportation only)
 - treatment and disposal of contaminated groundwater
 - compensation for Source Removal Report

LIMITED SOURCE REMOVAL INITIATIVE

- 81 CDFs received
- 17 Work Orders executed
- 29 Proposals in-house
- \$743,300.59 encumbered to date
- Average Work Order - \$38,500
- Contact Information

Rainier Viera – BPSS, PCS5
850.222.6446, extension 259
rviera@wrsie.com

Delay of Remedial Action for Small Discharges within Exclusion Zone

- Applicable to cleanup of discharges that will be initiated prior to 1/1/2010
- Site assessment must be completed
- Groundwater plume is at NAM levels, confined to source property and source of the plume is within the exclusion zone
- Depth to groundwater limited such that normal excavation techniques will remove contamination in unsaturated zone (< 25 ft)

Delay of Remedial Action for Small Discharges within Exclusion Zone

- Source of the discharge is confirmed to have been corrected
- RAP proposing future source removal and interim monitoring is submitted, along with...
- Request to modify timeframes in accordance with subsection 62-770.800(4), FAC
- If responsible party is not the facility owner, a letter of authorization to delay remediation from the property owner
- Confirmation of insurance carrier concurrence

Delay of Remedial Action for Small Discharges within Exclusion Zone

- RAP Approval Order issued that authorizes a delay in initiation of remedial action and includes:
 - Specific date by which the source removal must be initiated
 - Interim monitoring and reporting requirements
 - Action necessary if action levels are exceeded
 - State that order allowing deferment only applies as long as current owner owns the facility
 - Stated enforcement consequences for failure to timely conduct the source removal as scheduled