Intersource Facility & Process Memorandum

April 2014

A "Tiller Group" Company

- INTERSOURCE OVERVIEW
- VALUE PROPOSITION TO REFINERS
- INTERSOURCE'S PROCESS
- REGULATORY CLARIFICATION
- INTERSOURCE PROFITABILITY

The Intersource Business Model

Intersource specializes in reclaiming marketable hydrocarbon products from large-scale refinery "rerun" and off-spec hydrocarbon products

The Company's EPA approved Process:

- Solves a key environmental problem for refiners
- Creates a new profit stream from what is now a significant cost
- Provides Intersource with substantial profits and growth potential

Intersource has achieved average gross margins of 45% from specialized hydrocarbon recovery at facilities leased from others

INTERSOURCE
Integrating Industry with Source Reduction

Primary Sources Of Intersource Feedstock

API Skim Oil

- Desalter Effluent Water
- Tank Farm Water Draws
- Storm Sewers
- Oily Sewers
- Sour Water Stripper Effluent
- Flare Knockout Drum
- Amine Unit
- Boiler Blow Down
- Cooling Tower Blow Down
- Coker Blow Down

Slop Oil
"rerun"
Refinery

Episodic Recovered Oil

- Tank Cleanings
- Turnaround Wash Oil
- Off-Spec Rerun Oil
- Spill Recovery

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A source of Slop Oil – Tank Cleaning (traditional method)

Oil reprocessed at crude unit

Slop Oil or Rerun Tank

Recovered Oil

In Situ Circulation Process w/Cutter

Ex Situ Process at tank site using Centrifuge, Heat

Traditional Methods use Cannons or External Pumps and Circulation

Centrifuged Material

A combination of heavy oil, water and sediment produced

Waste sent to third-party coker (2911)

or incinerator

Waste sent back to coker

By Selling Off-Spec Product to Intersource, Refiners Will Capture Significant Operational Benefits

- By selling these products to Intersource, refinery margins will increase as a result of
  - Revenue from sale of rerun
  - Improved energy indexes
  - Reduced maintenance cost
  - Improved reliability
  - Improved tank capacity

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How do Operational Benefits Convert to Dollars?

- An NPRA (National Petroleum Refiners Association Paper that discusses in detail the direct effect of slop oil on various units and operations within the refinery: A. NPRA Paper.docx

- INTERSOURCE working with PFC Energy, a prominent energy consulting company, modeled the estimated savings for several majors and their Gulf Coast Refineries ONLY: All Models reflected potential margin gains of .15 to .20/bbl for TOTAL throughput when selling their slop oil

- Shell Oil provided a letter to Intersource, expressing a desire for a long term business relationship, but also recognizing the cost of slop oil on the total refinery and the potential for savings when we had the capacity to intake all of their slop oil. Intersource has been limited to specific projects due to capacity limits. B. Shell Letter.pdf

*** Files are hyperlinked, right click and click on open hyperlink

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Intersource Method

Refinery

REFINERY TANK
(Intersource Sales Tank)

Recirculation Pump

Product Sale or Transfer under SIC 2911 Exemption

Transport Recovered Products to Intersource Facility

Intersource Specialized Reclamation Facility

Intersource Product Tanks

- Gasoline Intermediates
- Diesel Intermediates
- Kerosene Intermediates
- LVGO Light Vacuum Gas Oil
- HVGO Heavy Vacuum Gas Oil
- VTB (Asphalt)

Recovered Water to Treating Reuse or Deep Well

Solid Waste to Kiln Or Thermal Desorption Unit

Processing Facility Flow Diagram

Receiving

Pre-Processing
10-40 K bbls

Crude Charge Tank
Minimum - 100 k bbls

Distillation Tower
Volume - TBD

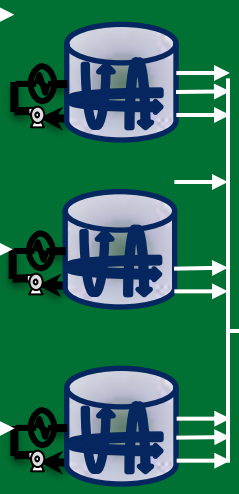
Product Tanks

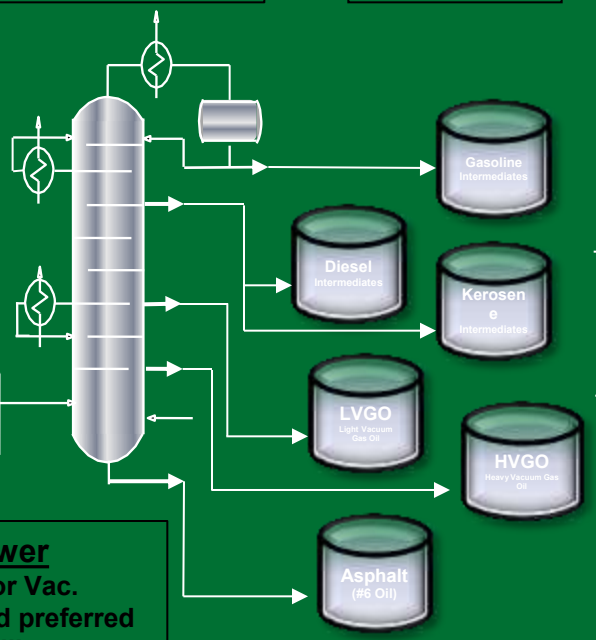
Product Out

Tank Truck

Rail Car

Barge & Panamax





Tank Truck

Rail Car

Barge & Panamax

Pre-Processing Tanks
- Insulated
- Heated
- Circulation Pumps
- Intersource Mixing Nozzles
- Multiple Level Draw Off
- Full Drain Bottom
- Vapor Controlled

Distillation Tower
–Can be Atmos. or Vac.
–BPD 15-25 K bpd preferred
–Desalting capability not required

Includes:
- Waste Water Handling
- Cooling Water
- Vapor Control & Flare

Solid Waste to Kiln Incinerator or thermal Desorption unit on site

Recovered Water to Treating Or Reuse or Deep Well Injection

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The Intersource Process

- An Intersource Facility looks very much like a simple refinery with one key difference: our patentable “PRE-PROCESSING UNITS
- A detailed description of the Intersource Process: C. Intersource Process Description.doc
- Intersource perfected the “pre-processing unit” operations at a pilot plant with “to scale” tankage retrofitted for use as “pre-processing units”: 40K, 5K and 6K tanks

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Federal and State Regulatory Clarifications

- Intersource has a full understanding of both Federal and State Laws which allows Intersource to purchase and process all off-spec oil created within the refining process as well as terminal and pipeline off-spec oil
  - A detailed explanation of 40 CFR and the Intersource "niche" market: D. 40 CFR and EPA clarification.docx
  - EPA LETTER : E. EPA Letter.pdf
  - TCEQ LETTER: F. TCEQ Ltr.pdf
  - LDEQ LETTER: G. LDEQ Letter.pdf

** hyperlink: right click on file, click on "open hyperlink"

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Intersource Profit and Margins

- Historically averaged $20-25/bbl net
- All Pilot Plant Processing was in leased facilities creating a scenario where repair, distillation and water treatment occurred at separate locations increasing cost to process our products
- Our central refining facility enables us to pre-process, distill and sell finished products as well as dispose of water and treat solids with thermal desorption in order to increase already healthy margins substantially and to increase the intrinsic value of the process in anticipation of an eventual listing

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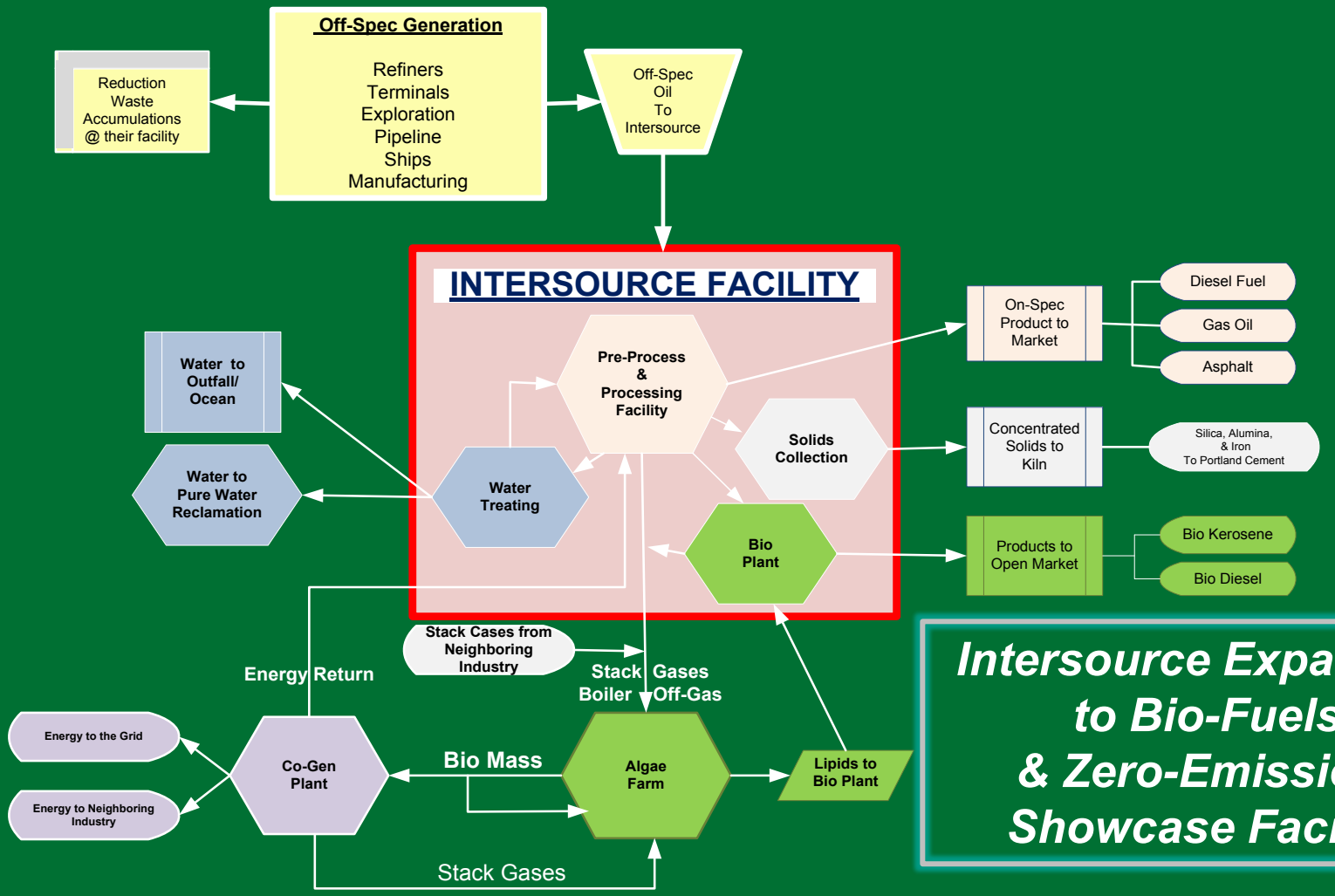
INTERSOURCE PRICING STRUCTURE

- INTERSOURCE has developed a pricing structure that gives consistency for pricing for products with varying quality and quantity
- INTERSOURCE has used this structure and finds it effective with the major refiners. Essentially: Intersource developed an “internal hedge” with our pricing structure

❖ Intersource Facility -- Expansion



Intersource Expansion to Bio-Fuels & Zero-Emissions Showcase Facility

02-15-2010 JHR

Turning Dangerous, Expensive Waste Oil into Valuable, Clean Products: A Brief History of Intersource and our Path Forward

The Oil Waste Problem. The world's oil refineries generate more than 250 million barrels of waste oil each year. The waste, commonly called slop oil, is thrown out in various ways to the air, water and ground of the world in a daily, wasteful, environmental disaster. These practices are universally harmful to communities around the world and cost refiners hundreds of millions of dollars and consumers millions more. Intersource offers a way to reclaim much of the slop oil as useful products while reducing the harm to the world's environment, converting greenhouse gas emissions into new energy, and preventing the loss of expensive hydrocarbon value. At the same time, Intersource facilities in the rapidly developing economies can generate major new economic development opportunities and significant profits for facility operators.

Oil Waste Treatment Today. Slop oil today is handled like many other kinds of waste. Some is trucked into deserts or poured into open waste pits in rain forests. Some slop oil is burned, some is buried in hazardous waste dumps, and some is reintroduced into refinery crude oil streams. Oil that is burned or dumped into the environment poisons air and water with heavy metals, poisonous chemicals and huge volumes of greenhouse gases. The oil that is rerun through refineries fouls refinery process equipment. The fouling of equipment reduces energy efficiency in refineries, forcing the consumption of additional energy to produce hydrocarbons and generating still more greenhouse gases. The rerun material is a frequent source of refinery upsets that, in addition to risking lives and property, send vast plumes of gases and carbon dioxide into the atmosphere. PFC has estimated that a refiner's energy costs can be as much as four percent higher as a result of rerunning slop oil. Those costs, of course, translate into more greenhouse gas production as well as higher prices for products. The Intersource Process can help to eliminate almost all of these extra costs.

The Cost of Traditional Waste Treatment. Refiners treat slop oil disposal as a necessary cost of doing business. They have focused their equipment and processes on refining non-stop streams of oil to maximize production of gasoline and other hydrocarbon products, handling slop oil as an annoyance to be disposed of as cheaply as possible. In some countries, refiners are bound by strict environmental regulations to control hazardous wastes and limit overall emissions. The large cost in such economies is passed along to consumers, and the large contribution of slop oil treatment to greenhouse gas emissions is not separately accounted for. In many other countries, refiners have not even had environmental limits on disposal, resulting in ruined water supplies, poisoned animals and despoiled landscapes.

Intersource History. In 2002 the Intersource principals recognized the adverse effects of slop oil on internal efficiencies of a refiner as well as the massive amounts of hydrocarbon currently leaving the refining market bound for disposal. Unfortunately, within the United States, environmental regulations prevented refiners from having a more efficient alternative. Intersource worked with Bracewell and Giuliani and currently with Dorsey and Whitney in order to create a more efficient alternative. Having

worked initially with TCEQ and LDEQ and having obtained their approval of the Intersource methodology, Intersource received confirmation from Federal EPA, that in view of the approval received from TCEQ and LDEQ, these materials could be sold as a product and not carry a waste code as long as it was sold to a legitimate reclamation facility such as a facility operating the Intersource Process. In the interim, Intersource operated using leased facilities within a terminal in order to perfect and increase efficiencies within our process. Intersource has purchased over the last four years over 500,000 bbls of distressed oil ranging from tank bottoms, wash oils and sunken barges. All of the oil has had its own unique problems and Intersource has successfully repaired and marketed an on spec product onto the open market. In doing so, Intersource has created a "niche market" and demand that now requires a larger and more integrated facility to handle the available volume of business. Recent disasters in the Gulf reflect another large potential market that will be a natural fit for Intersource as Intersource develops relationships with the Insurance Industry in order to have disaster plans in place before they occur.

In the path towards developing an integrated distressed oil repair facility and refinery, Intersource has developed strong relationships with several strategic partners who will be a strong asset in expanding this process worldwide and moving refiners to a position where the use of Intersource becomes "standard operating procedure" and it becomes the norm to sell all slop oil produced. PFC Energy is a preeminent consulting company devoted to energy benchmarking and the geopolitical issues that ensue. PFC will be invaluable when working with the National Oil Companies abroad as well as the Independent Oil Companies both on the subject of increasing internal margins at their facilities as well as sourcing and firming up long term contracts. In addition, they will be integral when locating the best facilities abroad that will be the best fit for retrofitting to our needs.

The Intersource team is a strong group with deep refining backgrounds. The team has a variety of backgrounds from operating engineers, hydrotreater and specialty chemical experts as well as waste treatment.

Intersource is in the process of forming an advisory board of experienced former major oil executives to enable the company to best structure it's services in line with the requirements of the top companies in the sector.

Dorsey and Whitney act as General Counsel and Environmental Counsel as well as helping to lobby the industry both within the United States and abroad. In dealing with both the Federal Government as well as the major oil companies who are our natural clients, it is important that the explanation of our unique environmental role is brought to them by recognized experts in the field.

<u>The Intersource Process and Its Promise</u>. Intersource offers refiners the ability to treat slop oil as a product rather than a waste. Intersource makes it profitable for refiners all to become contributors to environmental protection. At the same time, Intersource will play an important role in creating global sustainable energy practices.

Intersource is a specialized refining company that has developed the world's first large-lot reclamation process for slop oil, oil tank residues and other sources of fouled oil and oil products. The Intersource

process is subject to intense intellectual property protection effort and utilizes specialized treatment techniques using heat, water, chemistry and other processes. The process involves treatment in specialized tanks plus distillation in simple fractionation towers to recover maximum hydrocarbon value from distressed oil. Intersource has recovered hundreds of thousands of barrels of commercial products from the slop oil and tank residues of major refiners. Several patents have been filed and others are in process of being added.

The refining industry is not the only generator of slop oil that can be reclaimed by Intersource. Production activities and transportation activities and accidents produce significant levels of oil that cannot be processed by refineries. Terminals, pipelines and manufacturing processes also produce significant quantities of distressed hydrocarbons. As countries grow their economies, the use of hydrocarbon products will increase, resulting in rising slop oil generation and making reclamation ever more important. Intersource offers the opportunity for growing economies to build efficiency and sustainability into the economy as it is developed.

Intersource is, of course, a refiner and, in recovering useful hydrocarbons, inevitably creates its own carbon footprint. Because of its commitment to environmental remediation, Intersource has begun the analysis that it hopes will lead to such reuse of its heat and stack gases that it will create the model “net zero” refinery. Intersource is in discussions with a producer of algae biofuels to use refinery boiler and stack gas emissions to support algae growth. Intersource believes that it will eventually be able to establish reclamation refineries associated with algae biofuel production that generate 10% to 20% of its total fuel production from the algae that is fed with refinery stack gases. Intersource will deploy efficient heat exchangers and cogeneration facilities in its refineries as well. Overall, Intersource intends to aggregate energy savings and carbon reuse techniques in a way that makes its facilities leaders in demonstrating profitable and sustainable oil production.

In the course of improving the environment, eliminating waste of scarce resources, improving returns through biofuel production and making a profit, Intersource will provide employment opportunities and support the growth of local industries. Because its raw materials and finished products are efficiently transported by water, Intersource facilities can be built in virtually any part of the world with deep water access and land and climate suitable for algae production. Similarly, existing refineries that are shut down can be repurposed and outfitted for the Intersource process. In this way, a local economy can move toward becoming self-sustaining in fuel generation and can reduce expensive purchases of oil from other regions.

Rerun and Off-Spec Product Recovery: New Opportunities with Industry-Wide Benefits

By: Monica Mills

Intersource L.L.C.

Presentation given at 2008 NPRA National Convention, San Diego California

ABSTRACT

Recent regulatory EPA clarifications give refinery managers new opportunities to boost productivity and lower environmental risk by selling off-spec oil to an outside reclaimer. This paper describes the risks associated with rerun processing and highlights an innovative transaction opportunity that, by removing off-spec oil from the refinery stream, allows refineries to reduce energy consumption and maintenance costs, increase time between turnaround for tanks and units, extend the life of catalysts, and reduce waste-disposal liabilities and costs.

INTRODUCTION

For many years, the refining industry has struggled with the management, treatment and disposal of petroleum rerun and the range of products of which it is composed. It is a problem that continues to grow, both over time and as a result of refiners' success in their core competency: the continuous processing of large quantities of on-spec crude into various finished products. Put simply, the more petroleum processed, the greater the quantity of resulting distressed oil — and the larger the problem for the refiner.

At the same time, ameliorating the problem by reducing the volume of rerun presents its own complications. If disposed of, this distressed oil must be handled responsibly and in compliance with strict federal regulations, making it costly and difficult. Given the lack of a market in which this distressed oil can be sold, most refiners elect instead to process this ever-increasing volume of rerun onsite. A shortage of tank storage and a desire to extract as much

value out of the product as possible lead many refiners to choose to process this off-spec material in conjunction with their primary slate.

Over the years, refiners have built and retrofitted various types of units to handle crude slates more effectively. Typically, a small amount of rerun (1% to 2% of total processing volume) is then introduced into the system, along with higher-quality crude. Unfortunately, product rerun does not typically meet the specifications for which the units were originally designed or subsequently retrofitted. Not only does the addition of this small volume of distressed oil fail in its original intent — to increase the volume of refined product and reduce the volume of rerun — it has, in fact, a significant negative impact on throughput, since the contaminants contained in this lower-quality product cause numerous processing complications, including safety, maintenance, efficiency, environmental and other downstream problems.

The net result of this no-clear-win situation is that many refiners operate with the assumption that processing stored rerun through their crude unit or coker, and dealing with the resulting equipment and refining problems, is the only viable alternative.

Until now, that is. Advancements in technology have made high-volume rerun processing more effective and more efficient, through reliance on independent facilities dedicated to repairing this complex material. At the same time, state and federal environmental regulatory agencies have issued clarifications of certain rules regarding distressed oil, confirming that it is a product that may be sold to a third-party reclaimer able to reclaim its valuable hydrocarbons. The U.S. Environmental Protection Agency (EPA) also has confirmed that the independent reclaimer — not the refiner selling the distressed oil — will be the generator of any wastes that may result from the rerun reclamation.

The result of these twin developments is that refiners no longer need to manage their rerun and the processing problems it causes — they can literally *sell* their problem product to a third-party company that is specifically positioned to handle rerun.

COMPOSITION OF DISTRESSED PRODUCTS

One of the primary problems refiners face in dealing with distressed products is the complexity and variability of their composition. A short description of the typical components of this distressed stream can shed light on the difficulty of processing this material:

Heavy Crude/Cutter. Traditionally, when a crude or product tank is cleaned and made ready for repair, the heavy-oil deposition is blended with a cutter and then passed back to the rerun tank. Every attempt is made to remove the water and particulate that exists within this oil. This is a difficult task in a field operation, since it usually requires large quantities of polymers and centrifuges, or batch treatment, in order to repair the usable oil. The resulting product often has some level of emulsified water and particulate still remaining. Also, the heavy oil recovered along with cutter requires a unique distillation curve that typically does not match that of the crude slate for which the processing unit has been designed.

API Skim Oil. Skim oil offers a veritable buffet of products that can be reclaimed. However, in addition to the raw crude from desalter undercarry, water and knockout pot products from throughout the refinery come along for the ride. API skim oil will usually also contain some level of amines and glycols from downstream units, as well as polymers that have been injected at the API separator. When the oil is being reprocessed, this mix of contaminants can compromise efficiency throughout the refinery.

Unit Wash Oil. When a unit is brought down for turnaround, the initial step is to wash the entire unit with a gas oil or light cycle oil dosed with a cleaning chemistry. This cleaning chemistry is quite effective in tightly emulsifying water and heavy oils from throughout the unit and exchanger. The gas oil is then sent back to a rerun tank in order to be processed slowly after the unit has been brought back in service. This begs the question: after spending millions of dollars to bring a unit back into pristine condition, does it make sense for the refiner to promptly return four to five years' worth of contaminant material back into the same system — or, for that matter, any other system within the refinery?

Off-Spec Product. Every refiner has situations in which it produces an off-spec product due to color, viscosity or failure to meet some other standard. Typically, these products are rerouted back to rerun and sent through the crude unit again in order to correct the problem.

However, off-spec product generally has a unique distillation point and often contains some level of olefins, which are exposed to oxygen while in the storage tanks. The capacity of oxygen-exposed olefins to gum and foul an exchanger train is well documented.

NEGATIVE EFFECTS OF RERUN ON REFINING UNITS

Insert complexities and unpredictability into any system, and unreliability will be the result. This is particularly true for the petroleum-refining industry, in which the processes and products are highly integrated. Given the composition of typical rerun, insertion of distressed products into the processing stream is likely to cause problems throughout the refinery. Some of the major, negative effects of processing rerun include:

Desalter Inefficiencies. Desalters are a refiner's first line of defense in preparing crude to be safely run. Rerun often carries a high volume of emulsified water, which can reduce the efficiency of the desalter. When the desalter allows increased water carryover into the heaters and towers, this water is typically "stabilized" with amines, which in turn results in increased fouling and corrosion within the refinery overhead. In response, refiners may initially try to starve the wash water feed in order to control water carryover. This approach, however, often results in water carryover with pronounced levels of salts, resulting in low pH values in the overhead. The net result of desalter inefficiency is that the refiner produces additional rerun — the very problem it was trying to manage.

Fouling. Due to the wide variety of products and contaminants in rerun, system fouling is a common result, with preheats often showing the initial signs of trouble. The foulants can range from heavy asphaltenes and paraffins, which dissipate due to incompatibility with the feed slate, to particulates dissipating in the large preheat exchangers (in which the relatively large feet/second ratio allows time for deposition). As noted above, the olefins within the feed contribute additional problems, including fouling within the exchanger trains, due to their exposure to oxygen.

Increased Metals (Complexed and Entrained). Virtually all crude slates contain some amount of complexed metals; these metals are more highly concentrated in the heavy oils which

form a major component of rerun. Levels of entrained metals such as iron are also typically elevated in rerun. Most metals have an adverse effect when reaching a catalyst, and will act as a poison that affects conversion and run lengths. In addition, entrained metals will have a deleterious effect on the fouling rate of exchangers and the effectiveness of desalters.

Nitrogen. As stated previously, rerun often has elevated levels of entrained water. This is generally the result of amines DEA and MEA from the API system, as well as specialty amines injected into overhead water in order to control corrosion. Regardless of the entrainment source, rerun oil typically will show higher nitrogen levels, which has the potential to shorten the life of hydrotreater catalyst.

Sodium Invasion at Cokers. As desalter efficiencies erode, increased corrosion in overheads is the direct result. This is due to the production of acids from the salts inherent in all crudes. Most crude-processing units, and some downstream units, use specialty chemical applications in order to neutralize these acids, prevent corrosion and minimize unplanned failures resulting from this corrosion. However, these specialty chemicals are also known to cause operational problems when used in excess, due to amine salt deposition at trays and exchangers. Specialty chemistry can also be quite costly at high volumes.

Another standard practice is the use of caustic injection in the crude train in order to minimize the acid production in an overhead. Unfortunately, caustic also has a large sodium component that progresses to the downstream coker and has an adverse effect on heater tube reliability.

The amount of additional energy required to fire coker heaters fouled by sodium invasion is extensive and can be a major expense to refiners. While removing rerun from a refining system will not eliminate the use of caustic in a crude train, doing so will help desalters become more efficient and control corrosion while optimizing caustic injection.

Environmental Excursions. Rerun is often the root cause of environmental excursions and increased loads on permit limits (including air emissions). Certainly, refiners make every effort to avoid such problems; however, given the many unknowns inherent in rerun, environmental challenges may be the result. For example, elevated water levels occur in units processing distressed oil, often forcing operations to struggle with pressure and control issues

and resulting in additional oil undercarry at desalters. As fouling limits heat exchange, refiners find themselves firing heaters at a higher rate — thus increasing emissions.

FINANCIAL EFFECTS ON THE REFINING SYSTEM

All of these technical and processing obstacles have an inevitable negative effect on a refiner's financial bottom line. Although the net impact of rerun processing is difficult to quantify (given the relative lack of data as compared to other refining processes), there is strong evidence to suggest that a significant percentage of a refinery's efficiency and throughput problems are the result of the 1% to 2% daily input of rerun. Specifically, rerun processing has an effect on:

Throughput. Recent reports suggest that refiners average approximately 88% to 89% throughput capacity on a daily basis. This average is a combined result of turnarounds, operational issues, and the strict specifications required to get a product to market. These capacity levels are also often achieved while the refiner is processing 2% rerun. Thus, the refiner is backing out 2% of raw crude and losing the expected crack spreads from these raw crudes. Since rerun and raw crude cannot be run at the same rate, some level of raw crude capacity is, by force, foregone in order to accommodate the rerun.

Energy Index. Fuel and fuel-component production requires a great deal of energy, the expense of which comprises more than 50% of average operational costs at a refinery. Since managing and optimizing energy consumption can quickly have a positive effect on a refiner's margins, refining operations are highly integrated in order to make the most effective use of generated heat. Exchanger fouling — the result of incompatibilities, polymerization, gumming and high levels of stream particulates — is therefore a constant concern, as few issues have a more pronounced effect on margins than a rapid decline in exchanger U-values.

Catalyst Life (Hydrotreater and CCU). In an era of extremely tight sulfur specs, catalyst life and efficiency is a major concern to the refining industry. Chief among contaminants that shorten the life of a hydrotreater catalyst are metals and nitrogen, both of which tend to be higher in rerun streams. Another common problem at hydrotreaters is high

delta p's across the catalyst bed. This crust is often the result of an upstream excursion that sends corrosion products into the bed.

Catalyst-bed replacement is an expensive and time-consuming project, as is bringing a unit down in order to remove the crust that causes high delta p's. Further, some refiners have reported iron sulfide invading the bottom bed, which makes a partial bed replacement a non-option. By limiting rerun and associated contaminants, hydrotreaters can minimize the risk of unplanned shutdowns and lengthen the overall life of the catalyst.

CCU catalyst conversion is likewise dependent upon a clean and steady product stream. Heavy oils and rerun tend to contain higher levels of complexed heavy metals, including vanadium and nickel, and higher levels of iron from corrosion throughout the refinery — all of which are known poisons and affect CCU catalyst conversion. In order to maintain conversion rates, refiners often opt to increase the input of additional fresh catalyst when experiencing degradation from elevated metals.

Maintenance Costs. Second to energy costs, maintenance-related expenses are the next highest operating costs within a refinery. As fouling and excursions are minimized, maintenance costs decline in a similar fashion. Unfouled exchangers do not need to be pulled for cleaning, pumps require minimal repair and throughput remains steady. When heaters are fired at the appropriate levels, hot spots and coking are limited. When corrosion is controlled, piping repair, tray and valve damage are minimized. When pumps operate within their design curve, seals maintain their integrity.

Safety. The importance of safety at a refinery cannot be overstated. Working with unpredictable and unreliable feedstock always increases the likelihood of processing problems in the unit. When units experience excursions, the risks to employees, the public and the environment increase dramatically. Even with the most experienced operators available, the best way to manage an excursion — and its associated safety, environmental and financial costs — is to prevent it from happening in the first place.

Refiner-processing of distressed oil presents these and other intractable problems. However, by selling rather than processing this distressed oil, a refiner can minimize these problems, reduce the production of additional rerun, and realize increased efficiencies and

profitability. Ultimately, by removing the rerun stream completely, a refiner can easily achieve an increase of at least 1% to 2% in overall throughput. (Given estimated total refinery/throughput capacity in the U.S. alone, this amounts to an additional 82 million bbls of crude processed on a yearly basis, or the addition of two new mid-sized refineries being built without additional capital expenditure.) Further, given a reduction in the problems that result from processing rerun, as described above, it is reasonable to assume that a refiner could achieve additional gains in throughput while seeing a pronounced reduction in operating costs such as maintenance, energy requirements, turnaround expenditures and catalyst costs. In other words, simply by managing their rerun in a new way, refineries could experience significant increases in margins.

A SHORTAGE OF STORAGE

In a time of steel shortage and large capital expenditures for the construction of new tanks, refiners find themselves increasingly pressed for storage capacity within their system. Further, the actual working storage capacity of existing tanks is even more limited. Based on tank surveys conducted by Intersource, it is common to find crude tanks with as much as 20% of capacity consumed with crude that is not viable — in its stored state — for processing at the refinery's crude units. This material tends to have a very high viscosity and/or pour point, a distillation curve skewed toward the heavy ends of the spectrum, and large quantities of entrained water — all of which can cause reliability or equipment problems during processing.

That said, the current non-viability does not mean that products cannot be produced from this distressed oil. It simply means that the production process is difficult, time-consuming and complex. For a busy refinery, there is rarely an opportune moment in which to attempt to process this unusual crude slate. As a result, refiners tend to manage the situation by not managing it at all. They often prefer to pull from the high draw and place a limit on how far they will draw down their tanks. By choosing not to low gauge, they attempt to minimize crude unit excursions.

For example, on a 200,000 bbl tank, a refiner may not allow the tank to pull beneath 65,000 bbls in tankage in order to prevent a "slug" of this distressed material from entering the

crude unit. Assuming a crude unit with three primary 200,000 bbl feed tanks each being managed in such a manner, it is quite likely that a new, fourth tank is at the top of the refiner's wish list. This pressure for additional storage is becoming stronger as refiners move to heavier crude slates and choose to blend crude slates onsite to maximize crack spreads; over time, they are finding that the build-up of the off-spec product in the bottom of tanks is increasing at a historically high rate.

The increased blending of crude in storage tanks adds an additional factor to the storage capacity problem. Crude is in general compatible with itself and often is significantly less compatible with another crude slate. (One can clearly see this phenomenon in crude assay studies: in a test tube, one can often see the paraffinic or asphaltenic reaction of two separate crudes. As the two are blended together, one can see the heavy asphaltenes or paraffins begin to flocculate to the bottom of the tube and entraining with any small amount of water that happens to be inherent in the crude.) As crude supplies decrease and demand increases, refiners must make the decision to purchase and blend these crudes in order to meet the design requirements of their particular crude units.

Currently, refiners are often caught between the proverbial rock and hard place: on the one hand, their customers and their own profit models demand the efficient production of high-quality oil and gas product; on the other hand, tank storage for rerun is in short supply. Unless refiners process the rerun, they will eventually run out of space. However, by increasing rerun-refining throughput, they in turn reduce throughput allocated to higher-quality, more easily processed and predictable product. Although hard data is difficult to come by, it can be estimated that for every 1,000 bbls of processed rerun, the refiner could have processed 2,000 bbls of their normal crude slate — with significantly fewer operational issues.

A SIMPLE SOLUTION TO A "GROWING" PROBLEM

Until recently, refiners had limited options on how to manage their rerun. Due to the wide variety of products that can potentially invade rerun, and the fact that rerun composition and processing requirements can change on a minute-by-minute basis, it is difficult to monitor or

foresee many of the operational issues that may arise. However, refiners have chosen to manage their rerun through various capital projects and through the use of chemical additives.

Two important developments have occurred to offer refiners an alternative means of managing their distressed products. First, advancements in technology have enabled the creation of independent facilities that specialize in recovering value from this complex material. At the same time, states and the EPA have clarified certain rules regarding distressed oil, establishing that when it is sold to such an independent facility for processing, it is a product and not a waste. Regulators have also agreed that materials resulting from the independent processing that may be disposed of as waste will be generated by that processor, rather than the refiner that sold the original product.

The result of these twin developments is that refiners no longer need to manage their rerun at the refinery. Instead, they can focus on their essential refining mission and divert the lower-quality products to an independent company that is specifically positioned to handle rerun.

Within the context of clarifying the regulatory status of these materials, the critical question is raised: Do these partially cracked, off-spec products high in metals, nitrogen, amines, stabilized water and assorted other distillations have any value?

The answer is emphatically "yes." The independent technological capacity now exists to manage the challenges that are typical of rerun streams, and to do so in a manner that meets regulatory requirements and provides additional environmental benefit. Since every quantity of oil purchased has slightly separate issues, each batch of distressed crude is addressed individually in equipment designed to effectively repair the feedstock for commercial markets. The process fulfills the state and federal legal mandates to recover valuable energy resources whenever possible, while reducing the amount of waste that is ultimately disposed of from the traditional approach to handling rerun.

Effective use of rerun material represents a high-value proposition to refiners. By selling rerun to a company specifically created to handle such products, refiners can increase throughput of higher-quality raw crude, maintain manageable energy indexes, reduce maintenance and catalyst costs, and increase margins on existing equipment. In short, maximize on-stream efficiency.

A NOTE ON REGULATORY DEVELOPMENTS

At the beginning of the 20th Century, crude appeared to offer a never-ending natural resource. The fact that a portion of the raw material seemed unusable was of little concern. Of primary importance to refiners was the mass production of the high-quality, on-spec products demanded by the marketplace. Few resources were applied to solving the problem of difficult materials such as rerun; recycling and processing improvements took a back seat to the development of a refiner's basic processes.

Nevertheless, when dealing with rerun, applicable laws and regulations are uppermost in the minds of refiners. The Resource and Conservation Recovery Act (RCRA) and its implementing regulations govern the disposal of solid wastes, including solid wastes that are hazardous. In RCRA, Congress also specifically recognizes that because petroleum is "increasingly scarce" and because reprocessing is possible, it is in the "national interest" of the United States to encourage the conservation of these materials (42 U.S.C. § 6901 a).

Under RCRA, states generally have the primary role in regulating solid wastes in accordance with the minimum standards set by the EPA for the best possible controls and monitoring requirements for solid waste disposal facilities. EPA is charged with identifying the characteristics of hazardous waste, listing hazardous wastes that will be subject to RCRA regulation, and establishing standards for disposing of these hazardous wastes. States may assume responsibility for implementing these EPA standards by developing and carrying out their own hazardous waste programs in lieu of the EPA-administered program. Key to the application of RCRA or its state counterpart laws is that the regulated material be a "waste."

Simply put, if the material is disposed of, it is considered a waste. If the material has value and can be sold, it is a product. RCRA also requires that waste derived from particular processes and locations be considered hazardous and disposed of under stricter standards.

Until these regulations were clarified, refiners found themselves with two expensive and unappealing choices for handling heavy crude ends. By processing their rerun, refiners could

negatively affect efficiencies and incur a whole host of processing problems, as noted above. Alternatively, they could treat the rerun as waste and meet all of the expensive environmental requirements for its disposal as hazardous waste. Given the costs of disposal and the lack of a commercial marketplace for off-spec oil, refiners for the most part have elected to process this distressed product as rerun and accept the operational consequences.

A major stumbling block to the creation of a sensible means of handling rerun was the perceived applicability of longstanding regulatory precedent. Clarifying the environmental regulatory treatment of materials exacts a significant investment of time and information to demonstrate to regulators that no environmental harm will result from appropriate use of the material. Over the last several years, Intersource worked with states and EPA to demonstrate that there is, indeed, a market for these materials that could result in benefits for the environment, industry, energy consumers and energy markets. Both Texas and Louisiana have concluded that the distressed materials sold by refiners to independent facilities, under certain circumstances, are products and not solid wastes. Building on the state analyses, EPA arrived at the same conclusion: rerun, when purchased by a third party for reclaiming under certain circumstances, is a product. EPA further clarified that any subsequent material generated from the reclamation process would be generated by the third-party purchaser and not the refiner that sold the distressed product.

In sum, once rerun is purchased by a company specializing in this arena, all responsibility for source reduction rests on the purchaser's shoulders. Not only is the purchaser able to recover productive hydrocarbon that can be resold in the marketplace, it is committed to finding productive uses for the materials that result from the refining of the rerun.

Initial tests indicate that the majority of potential waste created by this reclamation process consists of iron, silica and alumina. The next phase of the source reduction evolution is to find a productive use for this material and minimize the amount disposed. The primary candidates for the productive use of these materials are cement kilns. Up to 20% to 30% of Portland cement is composed of iron, silica and alumina, most of which is obtained from mining. Fuel is also required to create the intense heat necessary for the chemical reaction that ultimately produces Portland cement; an average kiln can consume up to 15 tons of coal per hour. Because the primary product of reclaimed rerun is high-quality hydrocarbon fuel, and its waste is

primarily composed of iron, silica and alumina, it stands to reason that the cement industry could consume 100% of the company's end products. This would greatly minimize the creation of waste material that is sent for disposal, providing a net environmental benefit.

Intersource is continuing to work with federal and state regulators to help them keep pace with the emerging markets for these usable products. With this major shift in the treatment and management of rerun, the charge has now begun toward increased efficiencies, reduced environmental impact, and a stronger, more sustainable refining industry.

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February 23, 2009

Reference: Intersource

Dear Ms Mills,

This letter pertains to our confidential business discussions with regard to supporting Intersource's business strategy to purchase low value off-specification fuel and residual materials for use as a raw material to produce higher value fuels for resale. Intersource's business model and implementation strategy appears to fit with SOPUS' sustainable development initiatives and HSE programs to optimize collective energy resources in an environmentally protective manner.

SOPUS programs support business strategies that enhance stockholder value and improve our global community. We support business activities both internally and externally that ensure environmental protection, promote diversity and achieve a cost-efficient and sustainable energy industry. Intersource, as a woman-owned small business, shares those values with us, and is considered a valuable contributor to our programs.

SOPUS refineries handle large volumes of hydrocarbon materials and streams as part of the routine business. On occasion, SOPUS also handles off-specification crude, intermediate, and final product streams that require special handling to capture the energy value of the materials. In the past and at a significant cost to our operations, the management of such materials may have included but not be limited to re-running by the process units, injecting into the coking operations, or disposal as waste. These activities represent costly operational activities that may negatively impact refinery operations and require significant resources to implement.

Intersource seeks to provide our operations another cost effective alternate to the above referenced traditional management options. We understand that you intend to do so by making commodity fuels using off-specification hydrocarbon and residuals. While not yet demonstrated, this alternative management option could improve the cost-effectiveness and revenue options of our operations, maintain environmental protection, and provide a valuable energy resource to society.

SOPUS is seeking a business relationship with Intersource that could be important to company operations and to our collective communities. This may include formal agreement for the process for sale and handling of off-spec fuels and hydrocarbon materials from our refineries. We have common business objectives, and we look forward to continuing our discussions.

While this letter is addressed to you, we agree that you may show it to other parties for the limited purpose of business development, and to that specific extent we waive the applicability of the confidentiality provisions between us.

Sincerely,

David Zabcik, CPSS
Environmental. Advisor

CC: Howard, Timothy J
Walker, Carita Shanklin
Gulick, Robert A
Espejo, Pierre M

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
SOLID WASTE AND
EMERGENCY RESPONSE

AUG 23 2007

Scott H. Segal
Bracewell & Giuliani, LLP
2000 K St., NW Suite 500
Washington, D.C. 20006-1872

Dear Mr. Segal,

This letter is in response to our conversation on December 21, 2006, during which you specifically commented on the reclamation of material removed from crude oil storage tanks. We then met again on January 10, 2007, along with your client Monica Mills of Wayne Glenn Associates, Inc. to further discuss this matter. At issue is how the federal hazardous waste regulations under the Resource Conservation and Recovery Act (RCRA) apply to both the material removed from crude oil storage tanks, and the residuals from recycling this material.

In the January 10, 2007 meeting, you and Ms. Mills described the various steps and processes involved in purchasing, transporting and processing petroleum-bearing materials from crude oil storage tanks (i.e., crude oil containing certain amounts of water and sediment) in order to produce a marketable petroleum product that is sold into the fuel oil markets. Ms. Mills also described her plans to manage any residuals generated from this processing by thermally treating them at a RCRA subtitle C hazardous waste facility.

After reviewing the information you provided, and prior written determinations from the Texas Commission on Environmental Quality (TCEQ) and the Louisiana Department of Environmental Quality (LA DEQ), [1] we believe that the states have already answered your questions regarding material removed from crude oil storage tanks that you purchase and reclaim into other fuel products. After what appears to have been thorough evaluations in response to Ms. Mills original requests, the TCEQ and the LADEQ cited their respective exclusions from the definition of solid waste for off-specification commercial chemical products being reclaimed, as well as the status of residuals that are generated during the reclamation of this material. However, I would like to clarify one aspect of the status of these residuals that are generated from processing the off-specification crude oil.

In a prior rulemaking, EPA identified "crude oil tank sediment from petroleum refining operations" as a listed hazardous waste (waste code K169 -- see August 6, 1998 *Federal Register*; 63 *FR* 42110). During that rulemaking, EPA's finding was that where these tank sediments are removed

1 Letter dated 4/29/03 from Scott Green, TCEQ, to Monica Mills; letter dated 12/08/03 from Linda Korn Levy, LADEQ to Monica Mills. As these letters were addressed to Ms. Mills, I have not enclosed them here.

and discarded, they are the listed hazardous waste K169. EPA also said that where these materials are de-oiled at the time they are removed from the tank, the recovered oil sent back to the refining process is not a waste, and the discarded residuals are identified as the listed hazardous waste K169.[2] However, the hazardous waste listing only potentially applies where the crude oil tanks are located at, or affiliated with,[3] a petroleum refinery (in contrast, where crude oil storage tanks are not located at, or affiliated with, a petroleum refinery, the K169 hazardous waste listing does not apply to the discarded tank sediments).

Where these crude oil tank materials are reclaimed and not a solid waste (as per the state determinations), the residuals generated during the reclamation process are newly generated at the point they exit the reclamation process. If the tank is located at or affiliated with a petroleum refinery, and the tank materials are reclaimed on-site at the petroleum refinery (such that any residuals to be discarded are generated at the refinery as well), these generated residuals would meet the K169 hazardous waste listing description. If, however, the crude oil tank materials were removed from the crude oil storage tank and sent off-site for legitimate reclamation, they would not be a solid waste (again following the state determinations for off-specification products being reclaimed), and the residuals generated from the reclamation of this material would represent a new point of generation. Thus, these residuals would not meet the K169 hazardous listing and would only need to be assessed for the RCRA hazardous waste characteristics. Finally, no listings apply to discarded tank sediments for crude oil storage tanks *not* located at or affiliated with a petroleum refinery, and one need only evaluate the residual for hazardous waste characteristics.

Of course, state hazardous waste programs may be more stringent than the federal program. So, I encourage you and Ms. Mills to continue consulting with the appropriate state agency if you have additional questions. If you have any further questions concerning this letter, please contact Ross Elliott at 703-308-8748.

Sincerely yours,

RW Dellinger

Robert W. Dellinger, Director
Hazardous Waste Identification Division

Cc: Ms. Monica Mills
Michele Peace, EPA Region 6

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2 See *Proposed Rule Response To Comment Document, Part III, June 1998 p. IV-2* (Item S0005, EPA Docket F-98-PRLF-FFFFF). Also, if these de-oiled residuals were oil-bearing hazardous secondary materials suitable for insertion into the petroleum refining process, rather than being discarded (i.e., they still contained recoverable hydrocarbon suitable for quench-coking), the residuals could be excluded from the definition of solid waste under a separate exclusion not discussed here (40 CFR §261.4(a)(12)(i)).

3 The term "affiliated" is used by EPA to clarify the scope of the K169 listing to include tank sediments from tanks containing crude oil that are owned by the refinery and used in refinery operations, including tanks that are either on the refinery site, or at tank storage areas owned or under contract to the refinery. See August 6, 1998 *Federal Register* (63 *FR* at 42151-52).

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

April 29, 2003

Ms. Monica Mills
Prowaste
8010 Needlepoint Road
Baytown, TX 77521

Re: Proposed Reclamation of Petroleum Storage Tank Residues/Purchase and Processing of Higher-Solids Oils
Solid Waste Registration Number **86552**
Technical Analysis File Numbers **2408, 2999 and 3007**

Dear Ms. Mills:

The Technical Analysis Team of the Texas Commission on Environmental Quality (TCEQ) has received your letter of April 21, 2003 of behalf of Prowaste, Inc. (Prowaste) regarding the reclamation of certain "higher solids oil" (hereafter referred to as "reclaimed oil products").

In summary, the main points of your April 21 letter are:

- Prowaste proposes to purchase stored oil products (e.g., crude oils, fuel oils, clarified oils, asphalt fractions, etc.);
- Because of the settling of naturally present solids, these same stored oil products contain levels of solids and water that vary between 15% and 25%[1];
- The typical hydrocarbon content of the stored oil product will be between 75% and 85%;
- Prowaste will pump the stored oil products to a barge or truck and transport them to a processing facility for the removal of excess solids by a centrifuge-based process;
- Once the centrifuging process has been completed, Prowaste will sample the reclaimed oil products to establish proper specifications, and if the products meet the proper specifications, they will be sold to products to refiners, manufacturers and other end users as a raw material;

[1] **On rare occasions, the percentage of solids and water may be as high as 30%.**

- Depending upon various factors, the solids that remain from the aforementioned reclamation activity will either be sold, reused or disposed of;

- None of the reclaimed oil products that Prowaste will purchase will be "non-pumpable residues", "oily sludges" or "tank bottoms" of the type that would remain in a storage tank following the application of standard industry practices for the removal of oil products from a storage tank (i.e., the addition of comparable product liquids as "cutter stock" and/or the physical agitation of the stored product to adjust viscosity and improve product consistency);

- The parent material from which the reclaimed oil products will be produced is unused products and *not* a residue left over after all useable product has been removed from the storage tanks nor is it a "spent material";

- If disposed of, the parent material that Prowaste will purchase and reclaim would *not* be a listed hazardous waste nor is the material expected to exhibit the characteristic of toxicity pursuant to 40 Code of Federal Regulations (CFR), Subpart C;

- The act of adding "cutter stock" to the parent material or agitating the parent material in order to improve viscosity and consistency of the material prior to its removal from storage tanks is an ordinary industry practice;

- In order to insure that the reclaimed oil products meet the necessary specifications needed to be used as a feedstock: (A) Prowaste will conduct appropriate tests on the potential parent material to determine whether oil products reclaimed from the parent material is likely to have a substantial market value, (B) once reclaimed, the oil products themselves will be tested to determine whether they meet appropriate market specifications and (C) a contract will exist between Prowaste and all potential buyers of the reclaimed oil products[2]; and

- The major criteria that will be used to determine whether the solids that remain after the reclamation process is complete can be used as Texas road base material are: (A) the solids must contain less than 5% hydrocarbons, (B) the solids must have no noticeable odor, (C) the solids must be a "fairly" dry cake and (D) the solids must *not* contain metals at levels that exceed limits at which they would be a hazardous waste.

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2 **Presumably the contract will contain specific, meaningful and legitimate specifications that the oil products must meet in order to be viable as a fuel, cutter stock or a refinery feedstock.**

Based on the summary given above, as well as the information provided in your earlier letters, the TCEQ has no objection to generators of the parent material from which the oil products discussed in this letter are reclaimed exercising their right to an exemption from the definition of a solid waste for commercial chemical products that are reclaimed (i.e., the exemption found in 30 TAC Section 335.1(131)(D)(iii)/40 CFR Section 261.2(C)(3)).[3]

In closing, I would like to address the matter on page four of your letter in which you request that the TCEQ concur that the solids generated from the aforementioned reclamation activity can be classified as a Class 1 industrial waste. Please note that the responsibility for making an initial waste classification for a waste subject to the requirements of 30 Texas Administrative Code Chapter 335 is that of the *generator* of the waste. Therefore, the TCEQ must respectfully decline to honor your request.

If you have any questions regarding this matter, please contact Mr. Jesse Boultinghouse of my team at (512) 239-2334. If responding by letter, please use Mail Code (MC-130) in the address.

Sincerely,

M. Scott Green
Scott Green, Team Leader
Technical Analysis Team
I&H Waste Permits Section
Waste Permits Division
Texas Commission on Environmental Quality

MSG/JKB/fp

Enclosure

3 In those circumstances where either the parent material or the reclaimed oil products are used as a fuel or a fuel additive, in order to be exempt from being a solid waste, that material or product must met the criteria found in the peer review document, "Factors to Consider When Determining Whether a Secondary Material is Either a Legitimate Fuel or a Legitimate Fuel Additive" (a copy of which is enclosed for your convenience).

State of Louisiana

Department of Environmental Quality

M. J. "MIKE" FOSTER, JR.
GOVERNOR

L. HALL BOHLINGER
SECRETARY

December 8, 2003

Ms. Monica Mills
PROwaste
8010 Needlepoint Road
Baytown, Texas 77521

RE: Regulatory Status of Proposed Reclamation of Higher-Solids Oils

Dear Ms. Mills:

The Louisiana Department of Environmental Quality, Permits Division (LDEQ-PD) is in receipt your correspondence dated October 14, 2003 regarding the reclamation of higher-solids oils being exempt from the hazardous waste permitting requirements.

The correspondence conveys the following points for consideration by the Department:

- The material that PROwaste proposes to purchase as an input to its process is unused, virgin product that may exceed ordinary refinery specifications due to elevated levels of solids, but these higher solids are still valuable unused products that can be sold for refining and other uses after undergoing the Fuel Cycle process.

- The material proposed for purchase is not designated as "tank bottoms", the purchased oil is not a discarded or abandoned material under LAC 33:V.109, and the higher-solids oil product to be purchased is not a spent material, secondary material, or sludge as defined in Table 1 of LAC 33:V.109.

- None of the reclaimed oil products that PROwaste will purchase will be "non-pumpable residues", "oily sludges" or "tank bottoms" of the type that would remain in a storage tank following the application of standard industry practices for the removal of oil products from a storage tank.

- The final disposition of solids generated from the reclamation process will be determined based upon analytical results (i.e. TCLP or other approved analytical methodology). Solids that exhibit a hazardous characteristic will be disposed of at an approved hazardous waste disposal facility. Those solids that do not exhibit a hazardous characteristic will be disposed at an approved solid waste disposal facility or considered for a beneficial use material (e.g. Texas road base material).

Based upon the information presented in the correspondence, the Permits Division has determined that the material PROwaste proposes to purchase for reclamation would be exempt from the definition of a solid waste as specified in LAC 33:V.109.

The Permits Division must reiterate that this determination applies specifically to the unused, virgin, products scenario described in the PROwaste correspondence dated October 14, 2003. The solids generated from the Fuel Cycle process must be properly analyzed and characterized for disposal at an approved waste disposal facility or for utilization in an approved recycling/reuse program. Also, the utilization of the generated solids as road base material in Louisiana would have to be evaluated and approved by the Louisiana Department of Transportation and Development (DOTD).

Should you have any questions regarding this matter, please contact Mr. Lenny Young, Office of Environmental Services at (225) 219-3003.

Sincerely,

Linda Kom Levy
Assistant Secretary

LKL/ly

CONFIDENTIAL MEMO

March 23, 2014

INTERSOURCE EPA LETTER AND CODE OF FEDERAL REGULATION CLARIFICATION

This memo is intended to add clarity and insight on both the Code of Federal Regulations for refiners (40 CFR) as well as the letter addressed to Intersource in August of 2007 by Robert Dellinger, Director of The Office of Solid Waste of the Federal EPA.

Refiners govern themselves according to the Code of Federal Regulations, the code specifically pertaining to refinery operations and specifically solid waste is referred to as the 40 CFR. These laws specifically define when a material is disposed of, both how it should be disposed as well as how it should be labeled. Also within this code, the EPA has allowed for certain exemptions to the law. They are very limited in scope and within the code are referred to as the "refiner to refiner" exemption.

The exemption is set out in EPA regulations at 40 CFR 261.4(a)(12)(i) and (ii). The regulations absolve the sending refinery from any regulatory responsibility for the waste treating by treating the transfer as part of normal refining operations rather than waste disposal. Here is how it works:

By law, oil sludges that are discarded are regulated waste. EPA regulations list certain exemptions from solid waste treatment. In order to encourage recycling of materials, at 40CFR 261.4(a)(i) EPA exempts from solid waste treatment "sludges, byproducts, or spent materials" that are generated at a refinery and either inserted in the refining process at the refinery or "sent directly to another petroleum refinery." Under 40CFR 261.4(a)(12)(ii) the same exemption applies to recovered oil from refinery operations, including oil from waste water.

Because the material that goes to another refinery is defined as not being solid waste, the sending refinery never has any solid waste regulatory responsibility for the material. That means that the receiving refinery (Intersource) becomes responsible for the material and will become the generator of any solid waste or hazardous waste that the material produces.

For additional clarity, although the EPA refers to these exemptions as the “refiner to refiner” exemption, the refining industry simply refers to the exemption as the “coker exemption” for the following reason. Refiners use this exemption in a very narrow fashion at their Coker’s only in order to incinerate a solid waste production. The coking unit of any refinery is considered the “life blood” of any refinery, it is where they squeeze out through final cracking that last available naphtha, diesel and gas oil from a bottom cut. This unit is what defines for any refinery a successful or not so successful ultimate “crack spread”. The coking unit, actually has a column that produces these final cuts from an incoming feedstock that looks very much like asphalt. Along with the upper cuts, this column also produces a bottom cut that is sent to “coke drums” and through steam and pressure results in a fine powder very similar to coal and is used for power production mainly in third world countries. These coke drums can be “finicky” to say the least and have a tendency to foam and pressure up, which causes the whole unit to reduce rates in order to compensate for the foaming and pressure resulting from the coke drums, thus the coke drums themselves, often are the “root cause” of a direct impact on the refiners overall crack spread.

While understanding all of this, refiners have discovered they are able to insert small amounts of “solid waste” into the feed stream leading directly to the coke drums and essentially hide the waste in a vast quantity of coke being produced. It is an on-going battle between operations and environmental due to the fact that the solid waste can often be directly correlated to additional foaming and pressure problems as well as final coke specifications vs. the need for the environmental to NOT produce a solid reportable waste and waste reduction requirements that every refinery has.

Now that we have discussed how refiners choose to utilize the “refiner to refiner exemption” or “coker exemption”, let us now discuss both what is solid waste as well as why refiners choose to utilize the exemption is such a narrow fashion. As I am sure everyone has read the NPRA paper, refiners develop a solid waste through numerous sources within the refinery. A solid waste is simply a thick heavy substance made up of heavy oil, water and solids such as dirt that has the consistency of mud. The majority of this mud like substance is created through centrifuge processes that go on throughout the refinery and or, often a backhoe that scoops it out of a tank that is being cleaned. All of the solid waste is placed

into disposal boxes that are big metal boxes that basically look like and act like a dump truck. They are called “roll off boxes” simply because they are big metal boxes that can “roll off a truck and have a large metal door at the back, just like a dump truck”. In reality, the majority of what is considered “solid waste” is actually heavy hydrocarbons that is caught in an emulsion with some level of water and dirt.

The NPRA paper I refer to explains in much more detail this process, however, the refiners are forced to remove as much of the “solid waste” by centrifuge from off-spec oil that ultimately produces a slop oil that after being centrifuged they attempt to “rerun” along with virgin crude. Even after the slop oil goes through the centrifuge process, the oil is still difficult to process and causes operational problems that is discussed in depth in the NPRA paper. Without the material being “pre-centrifuged” refiners would not DARE attempt to rerun the oil.

With this short explanation, it is now time to discuss how Intersource is providing an option that both falls within the refiner to refiner exemption, but also opens up additional options for refiners. Please note, the exemption is for a refinery to refinery exemption, it does not anywhere within the code state it must go to a coker, it simply states it must be distilled. Intersource is seeking to develop a refinery that is designed to distill the slop oil produced by refiners that they have NOT centrifuged. They simply sell Intersource the off-spec oil produced that is a combination of both the slop oil they would have re-run as well as the solid waste they would have produced and either disposed of or sent to a coker on an exemption. They have eliminated both their disposal issues as well as the on-going operational issues incurred from rerunning the cleaned up slop oil. It is a win/win for refiners from an environmental as well as an operation standpoint.

The uniqueness of Intersource is, we have developed a process, we actually consider a “stand alone” unit that we refer to as our “pre-processing unit” that has been developed by Intersource. These pre-processing units are designed to “clean” the oil and separate the water and dirt from the oil. These units allow us to develop an oil that is dirt and water free and ready to be safely distilled without the use of a centrifuge. In fact, the centrifuge creates a solid waste that is predominately heavy oil. Our process recovers that heavy oil and it is then distilled and sold as product. The Intersource process produces water and clean

dirt that is either filtered and properly disposed of or solubilized in the water phase and out falls within our normal water treatment process. Please note, Intersource operating as a refinery (SIC 2911), we are subject to the same disposal laws as our larger refiners that we are receiving feedstock from. Any "solid waste" we produce is considered hazardous and must be disposed of under the same regulations as defined by 40CFR. The difference is, we minimize our solid waste to dirt alone.

Typical Purchase Example*: Refiner sells Intersource 100,000 bbls of off-spec oil that through lab testing reflects 35% BS&W. BS&W stands for base sediment and water is a lab test performed by centrifuging the oil. The refiners if operating within the refinery and using centrifuges would have recovered 65,000 bbls of slop oil that would be rerun within the refinery and 35,000 bbls of solid waste made up of heavy oil, dirt and water (mud) that they either pay for disposal or send to coker to be slowly absorbed in the coke drums. This 35,000 bbls is equivalent to approximately 8,500 tons of solid waste since by rule of thumb, there is approximately 4 bbls per ton or yard of solid waste. On average, to dispose of a yard of solid waste, after taking into account: transportation, roll off box rental, actual disposal, box washing after disposal and paperwork, refiners cost a yard of disposal at around $700/yard. This 35,000 bbls of solid waste is approximately $6 million without taking into account the cost of the actual centrifuge and manpower required to create the solid waste.*

Intersource will purchase the entire 100,000 bbls. However, we understand that although the oil reflects through BS&W testing 35%, additional testing reflects a water content of 10% and an ash (dirt) content of less than 1%. Intersource, using our preprocessing units, will develop approximately 10,000 bbls of water that will be routed to our water treatment unit, treated and outfalled to the ocean once it meets EPA requirements. A great deal of the ash will actually go with the water, but the remaining will be caught in our filters and then properly disposed of. The ash that is in the water I am referring to is simply salts that are naturally soluble in water and occur within salt water. On average, this project will have created less than 5 bbls of solid waste that we are responsible for disposing of. The delta of 25,000 bbls that a normal refinery would have created becomes clean feedstock for Intersource that we then distill and sell as a product.

The Intersource facility, although it falls under the same regulations as other refineries, has developed a processing unit unique to Intersource that not only minimizes the waste, but also allows the refiners to take advantage of the full meaning of the refinery to refinery exemption, by selling ALL of their off-spec oil vs. simply transferring the solid waste to a coker. Please note, since refiners would elect to send ALL of the oil, not simply their solid waste, it now gives the oil some level of "value" as well. Although, Intersource deeply discounts our feedstock, we are accounting for some level of value recovered from the oil that is now rerun within the refinery and sold. Both the refiners as well as Intersource understand that rerun oil causes operating problems within the refinery which impacts overall margin, however, there is hydrocarbon value there. Intersource's pricing structure recognizes there is a value, but also accounts within the pricing structure, the costs of that oil. In addition, is also recognizes a separate argument and theme that is stated throughout the 40CFR. If a material has value to someone, it cannot be considered a waste.

The Intersource Refinery is unique and currently, a refinery specifically designed to intake off-spec oil to both repair and distill does not exist within the industry. After having in-depth discussions with patent attorneys, our "pre-processing units", product labels or MSDS's for our feedstock, our pricing structure for off-spec oil are ALL patentable events and as we begin to retrofit the facility, additional patent work will begin. Intersource already has a patent pending on a unique aspect of this type of oil, it is vessel retrofits for transportation of off-spec material. In order to be able to process this type of oil, you must be able to transport the oil and not leave massive levels of solids left within your transportation vehicles. If you can't efficiently transport the oil, you can't efficiently process.

Here is the actual language of the 40 CFR 261.4(a) with additional highlights of the most pertinent parts.

261.4 Exclusions

(a) Materials which are not solid wastes. The following materials are not solid wastes for purposes of this part:

(12) (i) Oil-bearing hazardous secondary materials (i.e., sludges, byproducts or spent material(s) that are generated at a petroleum refinery (SIC

code 2911) and are inserted into the petroleum refining process – including, but not limited to, distillation, catalytic cracking, fractionation, or thermal cracking units (i.e., cokers) unless the material is placed on the land, or speculatively accumulated before being so recycled. Materials inserted into thermal cracking units are excluded under this paragraph, provided that the coke product also does not exhibit a characteristic of hazardous waste. Oil bearing hazardous secondary materials may be inserted into the same petroleum refinery where they are generated, or send directly to another petroleum refinery, and still be excluded under this provision. Except as provided un paragraph (a)(12)(ii) of this section, oil bearing hazardous secondary materials generated elsewhere in the petroleum industry (i.e., from sources other than petroleum refineries) are not excluded under this section. Residuals generated from processing or recycling materials excluded under this paragraph (a)(12)(i), where such materials as generated would have otherwise met a listing under subpart D of this part, are designated as F037 listed wastes when disposed of or intended for disposal.

(ii) Recovered oil that is recycled in the same manner and with the same conditions as described in paragraph (a)(12)(i) of this section. Recovered oil is oil that has been reclaimed from secondary materials(including wastewater) generated from normal petroleum industry practices, including refining, exploration and production, bulk storage, and transporation incident thereto (SIC codes 1311, 1321, 1381, 1382, 1389, 2911, 4612, 4613, 4922, 4923, 4789, 5171 and 5172.) Recovered oil does not include oil bearing hazardous wastes listed in subpart D of this part; however, oil recovered from such wastes may be considered recovered oil. Recovered oil does not include used oil as defined in 40CFR 279.1.

During the rulemaking on the exemptions, EPA explained the refining exemption:

“Once the sediment is removed from the tank or filter system, the residual destined for discard is the listed hazardous waste. In the case of oil recovery operations which coincide with the removal of the oil bearing residual from a tank or process unit, these operations are viewed by the agency to part of normal petroleum refining and not subject to RCRA permitting.” “Petroleum Refining

Listing Determination Proposed Rule Response to Comment Document" EPA, IV-2 (June 29, 1988), available at

http://www.epa.gov/osw/hazard/wastetypes/wasteid/petroleum/prop3.pdf

I think the above detailed explanation outlines the "refiner to refiner" exemption that Intersource and its customers can rely on to transfer all waste responsibility to Intersource as well as how once Intersource receives said oil, we process in a very different manner that **SIGNIFICANTLY** reduces any subsequent solid waste we would then be responsible for disposal of. In addition, Intersource also holds letters from TCEQ, LDEQ and EPA approving the sale of tank sludges to Intersource along with the regulatory responsibility for the material also transferring to Intersource.

After a detailed discussion of the refinery to refinery exemption and it's significance, I would now like to discuss specifically what the EPA letter addressed to Monica Mills (Lloyd) and Intersource specifically says as well as the history of obtaining this letter.

As Intersource and the founder (Monica Lloyd) sought to purchase off-spec material from the refineries, initially, Intersource **did not** seek to operate a stand alone refinery. We sought to purchase this off-spec material and transfer to a location that we could operate our "pre-processing" units only, repair the oil and then resell on the open market, we did NOT seek to distill the recovered oil, merely sell "as is". We approached the agencies with a relatively simple argument and sought clarification of existing 40CFR . Intersource seeks to purchase a product that we deem has "value", therefore, if a material has value, it cannot therefore be considered a "listed hazardous waste" and therefore cannot have "cradle to grave" disposal implications.

The regulatory agencies responded to Intersource with a relatively "narrow" ruling, but was groundbreaking from a precedent standpoint in the eyes of refinery throughout the United States.

The EPA letter addressed to Intersource and our environmental attorney Scott Segal dated August 23, 2007 stated the following as a clarification to existing 40CFR for crude oil tanks ONLY.

"In a prior rulemaking" EPA identified "crude oil tank sediment from petroleum refining operations" as a listed hazardous waste (waste code K169 – see August 6, 1998 Federal Register; 63 FR 42110). During that rulemaking, EPA's finding was that where these tanks sediments are removed and discarded, they are the listed hazardous waste K169. EPA also said that where these materials are de-oiled at the time they are removed from the tank, the recovered oil send back to the refining process is not a waste, and the discarded residuals are identified as the listed hazardous waste K169. However, the hazardous waste listing only potentially applies where the crude oil tanks are located at, or affiliated with, a petroleum refinery (in contrast, where crude oil storage tanks are not located at, or affiliated with, a petroleum refinery, the K169 hazardous waste listing does not apply to the discarded tank sediments).

To put it bluntly, what the EPA is saying, for the narrow definition of sediment deriving from crude tanks only, if it comes from a refinery, it is a listed hazardous waste with cradle to grave implications, no matter what. If it comes from production (drilling), terminals, pipelines or another source, the sediment is only hazardous if through testing it is defined as hazardous. The question for refiners that they needed additional clarification on was this, if they sold their crude oil bottoms to a third party and it was subsequently processed and "de-oiled" at a facility other than their refinery, would the K listing an subsequent cradle to grave responsibilities follow the crude and de-oiling process.

The EPA in the following paragraph provided an answer to this looming question in a narrow but groundbreaking way. This response left a great deal of room for EPA oversight, but also began to give refiners a "glimmer" of hope to refiners, but all hinges on the word "legitimate". Please understand, for lack of a better phrase, this is a loaded sentence, that after numerous conversations with almost all of the refinery environmental managers, they quickly realized how this wording has narrowed the field to simply, Intersource without the refiners taking the risk that any others they send or sell to could be subject to the unanswered question by the EPA, "Are they legitimate"? In fact, Exxon actually had the "moxey" to ask me to go back and further expand the definition of what "legitimate" was? My response was simply, "why would I do that"?

In some ways, this simple but loaded wording comes back to a "face to face" conversation I had with the EPA and the person's in charge of the OFFICE OF SOLID WASTE, that I was asking to put in writing a clarification. After many years, of emails and discussion and hiring of lobbyist to facilitate these conversations, I had developed a personal relationship with the regulators themselves. In a meeting in Washington DC with the regulators, I finally asked a very blunt and pointed question that I simply could not understand the answer to? What I asked was this, "I do NOT understand, why getting a written clarification of my question is so difficult? What Intersource is discussing doing is the RIGHT thing to do, it positively impacts the entire refining industry. It can have an impact on air emissions, solid waste production that we are able to turn into something that is productive and useful vs. something that is simply incinerated with no productive impact for anyone? Why is this so hard?" The answer that came back to me was enlightening. The head of the Office of Solid Waste, Robert Dellinger smiled and responded with a simple but telling answer, "Monica, if we could direct the answer to you and Intersource alone, it would be that simple. We know you, we understand your process, we are comfortable that you and your company would handle all of the subsequent streams both legally as well as morally in the correct manner. Unfortunately, we are the EPA, a federal regulatory agency, and any letter addressed to you is both public and not subject to such narrow discretion to limit it to one company alone. Unfortunately, within the EPA, we deal with bad actors that actively choose to either outright break the law and or "twist" the law in a manner in which the EPA did not intend. We have to respond with the bad actor's in mind, knowing and assuming they will take any response given to anyone and attempt to use it for illegal purposes. We are struggling to develop a response for you that allows this forward action for recycling while limiting the bad actors of the world." This response brought on a new level of understanding for me and shortly thereafter, Intersource received a letter referring to "legitimate" recycling.

The actual paragraph said the following:

Where the crude oil tank materials are reclaimed and not a solid waste (as per the state determinations), the residuals generated during the reclamation process are

newly generated at the point they exit the process. If the tank is locate or affiliated with a petroleum refinery, and the tank materials are reclaimed on-site at the petroleum refinery (such that any residuals to be discarded are generated at the refinery as well), these generated residuals would meet K169 hazardous waste listing description. If however, the crude oil tank materials were removed from the crude oil storage tank and sent off-site for legitimate reclamation, they would not be a solid waste(again following the state determinations for off-specification products being reclaimed), and the residuals generated from the reclamation of this material would represent a new point of generation. Thus, these residuals would not meet a K169 hazardous waste listing and would only need to be assessed for the RCRA hazardous waste characteristics. Finally, no listings apply to discarded tank sediments for crude oil tank not located at or affiliated with a petroleum refinery, and one need only evaluate the residual for hazardous waste characteristics.

This simple wording, but with loaded implications, is however, GROUNDBREAKING. This is the only place in writing, in which the EPA has ever, allowed for an exemption or out clause for ANYTHING that has ever had a cradle to grave implication. Until this letter, refiners interpreted the law as once it was within the refinery operation and had the potential to be a listed waste, it was ALWAYS a listed waste unless the material was exempted by transfer to another refinery in which if they created a waste for disposal, it was subject to the same law. In addition, this letter, although per federal law and is a public letter, leaves the refiner open and subject to much scrutiny when the question of what is legitimate recycling is concerned? Since the letter is addressed to me and they openly discuss and refer to our discussions of our unique process, by default, they are acknowledging our process is “legitimate”. It leaves an open ended problem for refiners and a liability nightmare if they chose to send or sell to a competitor of Intersource. In simple terms, if residuals were produced by a competitor, even if they were benign and harmless, but were disposed of at a sight in which at a later date becomes a “super fund” sight, the EPA then goes back and root causes the source of all material and naturally then migrates to those that have “the deepest pockets” and seeks payment and responsibility for clean-up. There is long standing precedent set for this, a glaring example being the example of “Marine Shale” and their recycling of material that they then used as road base

raw materials. After an audit by EPA, the resulting legal battle resulted in numerous oil companies being responsible for miles of roads both being ripped up and properly disposed of, but also having to pay to replace the roads. The costs entered the billions in which the EPA considered the refiners "on the hook" for.

Based on this narrow ruling, Intersource was purchasing and processing large quantities of crude oil tank bottoms from several refineries in a location that was NOT a refinery. Our pre-processing units were located within a terminal in leased tanks that we had retrofitted into our "pre-processing" tanks. We successfully repaired and recovered thousands of bbls of crude oil and other off-spec oil that did not necessarily derive from a refinery setting. However, Intersource, although working on a specific ruling and clarification for crude tanks only, was successfully purchasing and repairing oil, we were finding an internal hurdle that forced us to take one more step, we needed to distill our recovered oil in order to consistently sell our bbls on the open market. Our clean and recovered bbls, were a combination of both crude oil and cutter stock (diesel or HGO) and Intersource could not in good conscience market the bbl as virgin crude on the open market. Intersource needed to then locate a small refinery that we could transport our recovered oil to and distill into traditional products that were then easily marketed and sold on the open market. There are limited refineries that actually "toll" their distillation capacity out to others and Intersource found that this added step of tolling at another refinery outside of our control added logistic and operating dilemmas to our on-going operation.

As Intersource came to realize, our operation was not "complete" and as dynamic as it needed to be without our own distillation units, we also came to evaluate what acquiring a refinery would mean? What it meant was, not only would we fall under the narrow ruling by the EPA of being a "legitimate" source of reclamation for crude oil tanks only, we would then also fall under the BASIC 40CFR code using the refinery to refinery exemption. This is an actual double layer of protection for refineries, since Intersource operating a refinery is actually subject to K Listing laws and the disposal requirements. (PLEASE NOTE: OUR PREPROCESSING UNITS THAT ARE SPECIFIC TO INTERSOURCE ALLOWS US TO GREATLY REDUCE OR ELIMINATE ANY WASTE PRODUCED, WATER IS NOT CONSIDERED A LISTED WASTE). In addition, there are numerous sources of listed

waste within the refinery. K169 is the waste generated from crude tanks, K170 is the waste generated from Clarified Slurry Oil tanks, K164 is the waste generated from a slop oil tank emulsion (however, the EPA has refused to define exactly what a slop oil emulsion is and where it "stops" and "starts" within a slop oil tank), which leaves the refiners no choice from a liability standpoint to have to consider the entire tank a source of KListing.

In other words, our narrowly defined letter set some precedent for crude oil tanks, but by being defined as a SIC Code 2911 refinery, it opens up our feedstock possibilities to all off-spec oil sources within the refinery. Our NICHE in the market place is now protected by both a refinery to refinery exemption and our patents on very specific units that Intersource has perfected the process along with patents on how we defined the value of this oil and also defined and actually created "PRODUCT NAMES AND SPECIFICATIONS", we also obtained a description of being "legitimate" by EPA in which no one else has achieved.

Anyone else trying to enter this space would have numerous hurdles to overcome in order to compete with Intersource.

1) Unless they chose to operate as a refinery, in order to take ALL streams aside from crude oil, they would have to go back to EPA and obtain that clarification. It will NOT happen, I tried! In addition, to add a layer of comfort for refiners to know they are absolved from the K Listing issues, the refiners will most likely request a letter addressed specifically to that company recognizing the "legitimacy" of their process. If they are able to overcome these hurdles, they then will need to figure out how to effectively process the oil in another way, other than the Intersource Patented Process.
2) If a potential competitor chose to develop a refinery and fall under the refinery to refinery exemption. Again, at that time, they would have to develop an alternate means of repairing the oil for distillation, as that process is patented and protected by Intersource. In addition, the pricing structure in which we value the oil will be patented as well (our patent attorney feels our posting and evaluation is a standard and patentable, like a posting for NYMEX of PLATTS). They would also have to overcome the hurdles of transporting the product and any patents we hold on our

"feedstock". Oddly, our patent attorneys feel that by simply trademarking and registering products, for example a lube product of "slick 50" and "slick 100", we would be able to register and create PRODUCT MSDS's for a variety of off-spec products. Intersource actually has a trademark reserved for the product "FUEL CYCLE", Intersource would register FUEL CYCLE 100, 200 ETC. with various encompassing descriptions for the variety of off-spec products that would be our feedstock. Currently, no refinery actually has a full MSDS of for example a "slop oil" tank, for safety reasons, they simply file all of the products MSDS's that are in the tank into one file. However, for transporting reasons, the COAST GUARD requires one MSDS and a product name. Our patent attorneys are firm in the belief that even though numerous refineries are actually producing the product for Intersource, that does NOT prevent Intersource from defining their production as a "product" meant for Intersource tanks alone.

I hope that this lengthy explanation sheds light on the unique place in which Intersource has the potential to sit within an industry. In addition, I also hope that it allows a deeper understanding of the actual law and interpretation of said law. Furthermore, I hope it sheds some light on the very fact, Intersource has a very deep and intuitive understanding of highly complicated law.

By refiners committing to contracts for the sale of their slop oil, they are making great strides in the prevention and risk mitigation of future environmental excursions as well as having significant impact on their internal margins, which will provide greater returns for their stockholders. In addition, the Intersource facility can give refiners, exploration companies and regulatory agencies a great level of comfort that when accidents do occur, a facility and plan exists in which government agencies and companies can quickly and efficiently inact for clean-up. The Intersource facility has several phases of development planned. Phase two and three are all planned for later years after initial start-up that will include additional "pre-processing" units, a cutting edge water treatment facility, a cutting edge thermal desorption or oxidation unit for hydrocarbon recovery and efficient solids recycling system along with additional waterbourne and land transportation system specifically designed to transport hydrocarbon with high

solids levels. In addition, other facilities are planned to be developed throughout the U.S. from funds deriving from our initial phase one development. Our facility and transportation will be designed and retrofitted in order to safely and efficiently handle all the aspects of off-spec oil in order to recover as much usable hydrocarbon as possible while properly treating and disposing of any waste that derives from the feedstock. Both refiners and exploration companies have the opportunity to expedite the phase two and three developments in several ways. One, unfortunately, our first facility will not have the capacity initially to intake all of the off-spec oil developed throughout the industry. Those refiners who arrange to reserve a portion of our initial capacity with a "take or pay" arrangement, will allow for expedited expansion and retrofit of the facility. In addition, it is unfortunate, but it would be safe to say, the majority of all refining and exploration companies within the U.S. are in some phase of negotiating fines being levied by federal and state regulatory agencies from some past event that has occurred due to a root cause sourcing back to slop oil or an unplanned spill. There are government programs in place, in which in lieu of fines, corporations are able to invest in solutions that can prevent or mitigate future events. A commitment to Intersource from extended off-take agreements and space reservation as well as invested funds in lieu of fines for prevention of future events could greatly expedite Intersource's capability for handling every aspect of off-spec oil.