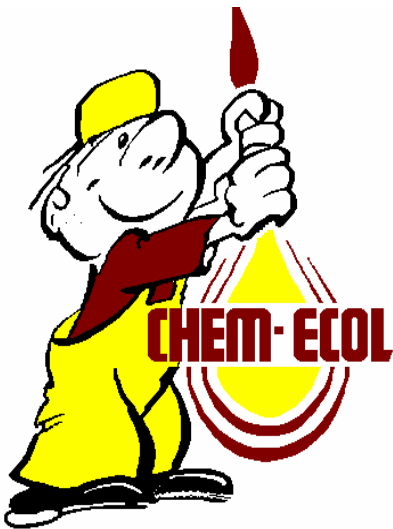


# CHEM-ECOL LTD.



## Mobile On-Site Oil Purification



# CHEM-ECOL LTD.

## Head office

640 Victoria Street, P.O. Box 955  
Cobourg, Ontario  
K9A 4W4

Telephone: 800-263-3939 or 905-372-2251  
Fax: 905-372-1658

Web-site: <http://www.chem-ecol.com>  
Email: [info@chem-ecol.com](mailto:info@chem-ecol.com)

## U.S. Operations

255 Great Arrow Avenue, Unit #13  
Buffalo, New York  
14207

Telephone: 716-877-4585 or 800-263-3939

Web-site: <http://www.chem-ecol.com>  
Email: [info@chem-ecol.com](mailto:info@chem-ecol.com)

# It IS possible!



# It DOES work!

# INTRODUCTION

Chem-Ecol Ltd was incorporated in Ontario, Canada in 1975.

The name is derived from “Chemistry and Ecology”.

Chem-Ecol Ltd was formed originally to specifically treat and purify segregated batches of industrial oils (hydraulic oils mainly) in minimum quantities of five drums, 225 I.G., or approx. 1,000 L and to divert these “waste oils” from dust control agents to useful lubricants.

The original concept was to have each customer collect their various “used lubricants” in drums, or bulk. We would transport them and process them as **segregated batches** through our plant. Everything possible was done in our plant to ensure that no two oils were mixed and that each customer received their original oil back for re-use. The intent was that the oil would be guaranteed high quality and would be re-useable in the original equipment it came out of.

Process equipment was designed to eliminate cross contamination of oils. All containers drain completely empty, as do any pipes used to move the oils through the process. Fluids in process are usually transferred using hoses (not permanent pipes). Hoses are cleaned after each use.

To improve customer confidence in the process, ALL CERTIFICATION work was and still is performed by INDEPENDENT LABORATORIES. Our policy has always been to use an outside laboratory. Should the customer wish us to use a laboratory specified by them, we do so and pay the bill. **We do not have any financial connection with any laboratory we deal with!**

Our goal is to provide **an absolute guarantee of product quality, before shipping the material back to the customer, or allowing it’s re-use for any purpose.** We do this by following very strict procedures for the processing and analysis of the oils. **No oil can be sent back to a customer, or can be re-used, until an independent laboratory has seen and approved the finished material.**

## CHEM-ECOL LTD - Plant Site – Cobourg, Ontario



# MOBILE PURIFICATION

Since 1984 we have built or operated mobile oil purifying units. We now have a fleet of what are generally accepted as the largest, most efficient units in North America.

Our latest unit will process low viscosity oils at rates in excess of **4,500** US gals per hour. It will process high viscosity gear oils (ISO 680) at rates of over 1,500 gallons per hour and can remove emulsified water at levels of 10 percent or more PER PASS. The unit is completely self-contained, has its own propane fired heating system and a 50 kW diesel generator for 3 phase power.

## FILTRATION

All units can purify oils down to an absolute filter rating of 0.45 micron and provide guaranteed ISO particle counts to the most demanding specifications. Normal filtration levels are to a 1/2-micron nominal rating.

Dirt and broken down additives are removed by passing the oil through a series of filters, each stage finer than the one before, until we reach the required cleanliness specifications. Absolute 0.45 micron filtration is available.

## WATER REMOVAL

Very efficient “vacuum dehydrators” (of our own design) remove water. Water removal is usually performed continuously and in a single pass. Residual water levels are typically below 50 ppm. Dielectric fluids are dried to typically LESS THAN 10 ppm.

## ADDITIVE RESTORATION

Additives, to bring the levels back to new oil concentrations, are blended in with continuous metering pumps during the process. Oils are analyzed prior to treatment to determine which additives require additions.

## STORAGE REQUIREMENTS

Oils that leak out of machines or that is taken out for preventative maintenance reasons can be stored in Pre-Treatment Tanks or 55 gallon drums, depending on the quantity.

We will supply storage tanks (as required) on a contract basis. Water and dirt that settles out of the oil is drained by the customer prior to our arrival and disposed of. Any water removed from the oil during our process is condensed back to liquid water and left for disposal. All filters used to remove the dirt are also left for disposal by the customer, after being drained free of oil and bagged.

## PURIFICATION CONSIDERATIONS

Research into how industrial oils degrade has shown that the lubricants supplied to industry today are very stable and do not *usually* oxidize in use. They usually become unusable because of contamination with dirt, moisture and broken down additives.

If these contaminants can be removed from the oils and the additive package can be restored to original levels; the oils can continue to be used for its original purpose.

The two charts on the following pages show this process graphically.

Our chemists and technical staff have been responsible for formulating and manufacturing Industrial oils for many years. This knowledge gives us the ability to determine which additives in these products are susceptible to breakdown and which are not.

Knowing exactly what additives are present in these oils allows us to tailor the treatment or purification method to minimize additive damage during the purification process.

This allows us to provide restoration additives only as required, rather than having to add unnecessary additives. By replacing only the required additives, we can provide specification re-purified products at the lowest possible cost to the customer.

Our long experience in the purifying of industrial oils allows us to pass on this to our customers and maximize the savings to them in the purification and re-use of these industrial oils.

Whether the quantity is five drums per year, or 5,000 gallons per week, we can and do help all our customers to the utmost of our ability.

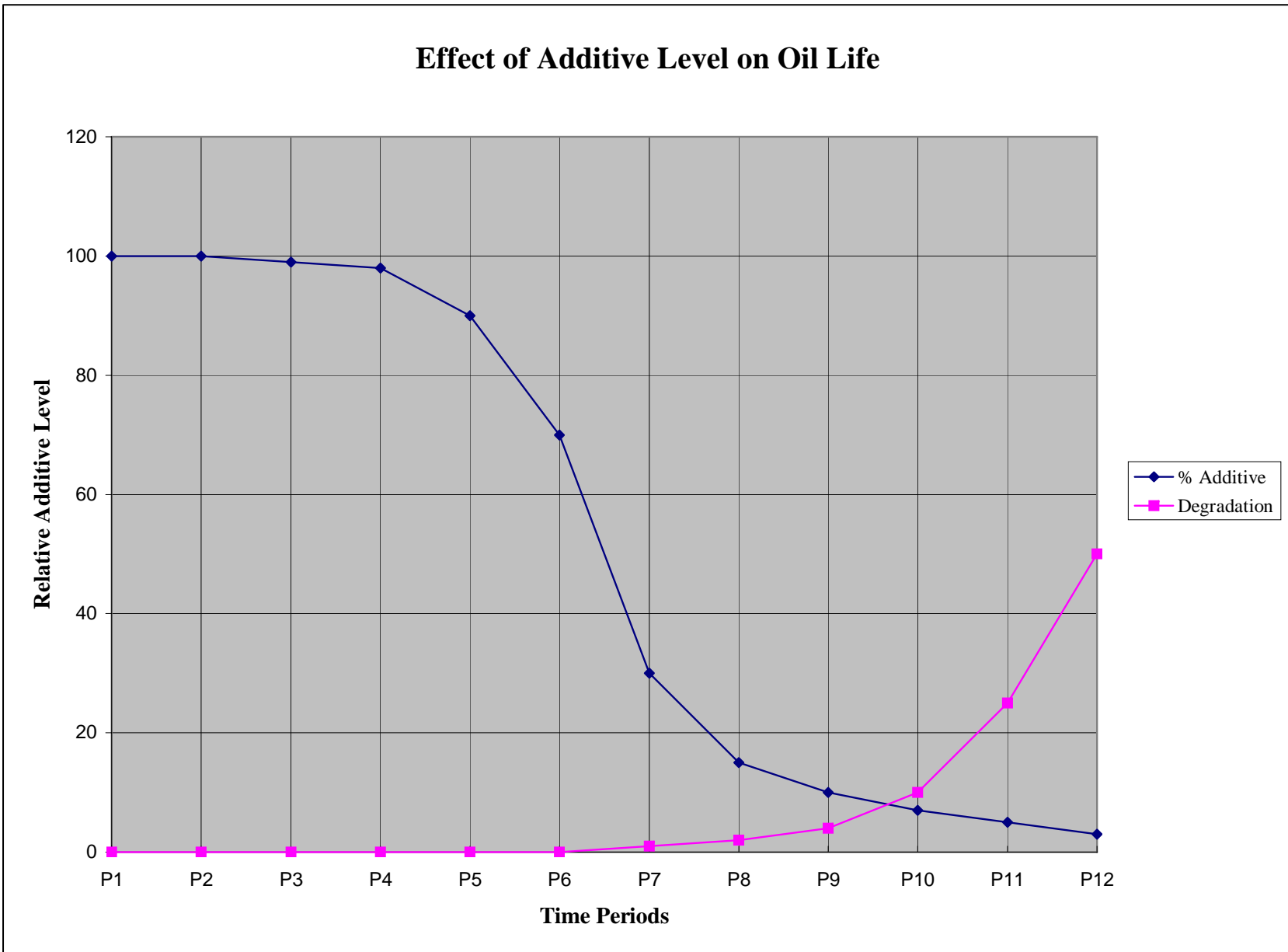
We have an unrivaled history of meeting specifications and product quality. We insist in having ALL production verified by truly independent QC laboratories.

This has led to customer confidence levels that are unsurpassed in this industry.

Unlike other companies in this industry – WE PUT NEW ADDITIVES IN ALL OIL PURIFIED BY US.

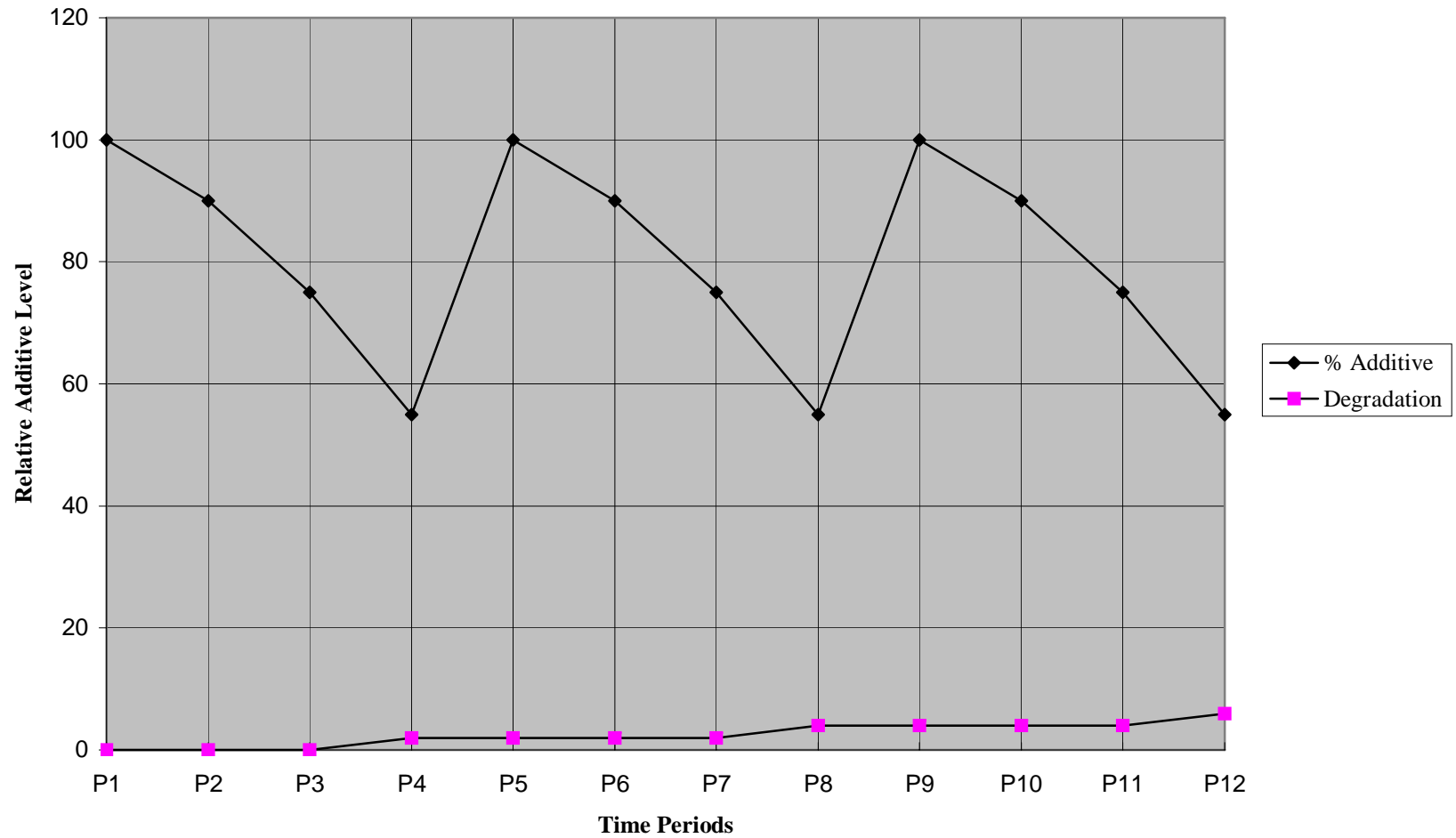
Whether the oils are processed in mobile equipment or at our main plant the correct additives are blended properly into each fluid.

During the life cycle of this oil, additives are constantly destroyed and depleted. Oil degradation (shown by the red line) increases until the oil becomes unusable and not reclaimable.



During the life cycle of this oil, periodically the oil is cleaned and purified. It is dried and broken-down additives removed. The additives are restored to new levels and the oil continued in service. Oil degradation (shown by the red line) remains at very low levels. [The life cycle of the oil can be extended many times.](#)

### Effect of Additive Level on Oil Life



# FIXED PLANT PROCESSING

Our central processing facility in Cobourg operates out of two buildings on a 12-acre site. An associated company owns the site and buildings.

Transportation of all products is by our own fleet of trucks. We operate both van trailers and multi-compartment tank trucks. All vehicles are part of our **Ontario Waste Management System** that is licensed by the Province of Ontario.

Our site is a **Licensed Waste Disposal Site** for waste oils under the **Ontario Government Regulation 347**, which is the governing regulation for all waste sites and waste transportation in Ontario.

**We are fully licensed to transport oily wastes in ALL STATES and PROVINCES.**

No waste is actually disposed of on our site. We have no landfill site and there are no buried tanks on-site. There is no incineration on site. All incoming products and wastes are processed and converted to saleable industrial lubricants, or sent for final disposal to a company such as Safety-Kleen for Re-Refining, or disposal by them in an authorized waste fuel program. All waste sent off-site for disposal is shipped using “waste manifests” and only sent to licensed and approved sites.

Most of the wastes received by our company are processed, purified and returned directly to the company that collected the oil. The product returned to the customer is normally used in its original application and not distinguished from virgin oil.

Product is processed immediately it is received and after processing is held in quarantine storage until an independent inspection laboratory has verified that the product meets specifications. Only after our laboratory has received this re-certification, can the shipment be released for shipment back to the customer.

Volumes processed range from a usual minimum of five drums, to full tank-trucks. Processing time is usually within 48 hours, but allowing for re-certification and shipping scheduling normally means about one to two-weeks between shipping of the waste and receipt of the finished product by the customer.

**Emergency turn-around of product within 24 hours is available on special request.**

# MOBILE OR ON-SITE PURIFICATION

## -WHAT DO YOU NEED?

On-site purification is ideally suited to systems that are operating, but have become contaminated for some reason.

**Mobile equipment can clean the oil in equipment while it still operates**

- **It can ELIMINATE machine shutdowns for oil changing.**

Cleaning the machine while it operates allows ALL THE OIL to be cleaned. Shutting down and draining the oil reservoir only replaces the oil in the reservoir – the dirty oil remaining in the rest of the piping immediately contaminates the clean oil put into the reservoir.

Cleaning with our equipment allows the TOTAL VOLUME of oil in the machine to be processed (usually about five times) during the cleaning process.

Water is removed to levels below 50 ppm. Dirt and silts from broken-down additives are removed, even the extremely fine particles that will pass through most machine filtration systems.

Additives are restored to new levels with additive packages specifically designed for each customer

**Costs are usually a FLAT FEE per gallon based on:**

- (a) The volume to be processed (i.e. machine reservoir capacity).
- (b) The contamination level.
- (c) The distance to be traveled by our unit.
- (d) The urgency. Non-emergency treatments can be coordinated with other customers. This allows us to distribute (and lower) mileage costs between customers.

## HOW TO DEAL WITH COLLECTED WASTE OILS

Oils that have leaked out of equipment, or been removed through oil changes can be treated just as easily as oil still in machinery.

The oils should be segregated as well as possible and stored in either 55-gallon drums, or in bulk storage tanks.

Chem-Ecol Ltd. can supply storage tanks and complete systems on a contract basis.

Collected oil should be screened to remove coarse contaminants prior to storage. This eliminates the problem of sludge build up in storage equipment. Water collected along with the oil can be stored with the oil. Free water that separates out in storage can be drained and collected for disposal.

## PRICING

The cost to purify oil varies depending on the amount of oil (the batch size), the degree of contamination, the water content and how much and what type of additives are needed to bring them to new oil levels.

A significant factor is the location of the plant. Transportation of the mobile equipment is a major cost. We try to co-ordinate multiple customers on each trip. This allows us to average out the transportation cost over a number of customers.

Most of our customers save **50% or more** of the cost of new oils. In addition you are **ELIMINATING A WASTE.**

Many States require businesses to certify each calendar year that they have reduced wastes generated each year. Purifying your oils is the easiest way to meet this requirement.

## WHAT OILS CAN BE PROCESSED?

Almost ANY STRAIGHT OIL can be purified. The secret is to keep oils as separate as possible. If oils have to be mixed it may still be possible to produce useable lubricants. Our chemists are familiar with most lubricant formulations and will make a judgment on whether the mixture is recoverable.

Minimum economic quantities are usually 500 gallons, subject to scheduling.

## WHAT IS THE FIRST STEP?

Send us a 1 qt sample of the collected waste oil. We will process this through our laboratory at no charge to you and provide an analysis and evaluation of the oil purification possibilities.

## STATEMENT OF POLICY

Chem-Ecol Ltd. undertakes to provide high quality oil purification services to industry. All production of purified products will be guaranteed to meet all normal production specifications or there will be no charge.

Chem-Ecol Ltd. will undertake to restore additives in the oil products that it purifies to levels that are considered “equivalent to new” oil levels. Each oil company producing lubricants has its own additive formulation that is “proprietary”. We cannot and will not claim that we are supplying “the same” additives. Chem-Ecol Ltd. will use its own experience, in consultation with major additive manufacturers, to produce additives that have equivalent performance to the original lubricant.

Chem-Ecol Ltd. in addition to operating an in-house quality control laboratory certifies that ALL lubricants purified by it will have the quality verified by an INDEPENDENT LABORATORY. Reports sent to each customer may have results from multiple laboratories compiled into one report. Original data for all reports will be kept and made available to each customer upon request.

Composite samples of all oils processed by mobile equipment will be taken and split into three samples. **Sample 1** is to be sent via courier to an independent laboratory. **Sample 2** is to be given to the customer. **Sample 3** is to be retained by Chem-Ecol Ltd. in its sample archives

Chem-Ecol Ltd. will keep retained samples from all batches of oils purified either by mobile or fixed plant equipment for at least FIVE YEARS.

All documentation, process sheets, batch sheets and shipping and receiving manifests will be kept for at least FIVE YEARS.

**Any customer, or potential customer is welcome to inspect any of our facilities without prior notice.**

A typical laboratory report will have a format similar to that below. Depending on the actual analysis required the report might be a compilation of reports from as many as three independent laboratories.

The report will be sent via fax or e-mail, as the customer prefers.



## LABORATORY REPORT

CUSTOMER:.....

DATE:.....

OIL TYPE:.....

BATCH NUMBER:.....

ANALYSIS NUMBER:.....

**RESULTS:**

VISCOSITY @ 40 DEG C IN CS:	.....
TOTAL ACID NUMBER:	.....
WATER CONTENT, PPM	.....
POUR POINT:	.....
I.S.O. PARTICLE COUNT	.....

### WEAR METALS MEASURED IN PPM:

ALUMINUM	.....	BORON	.....	CHROMIUM	.....
COPPER	.....	IRON	.....	LEAD	.....
MAGNESIUM:	.....	NICKEL	.....	SILICON	.....
SODIUM	.....	ZINC	.....	CALCIUM	.....
BARIUM	.....	PHOSPHORUS:	.....		

We certify that this oil is clean; that the additives are at normal levels and that the oil is suitable for re-use.

### COMMENTS:

Warnings and other comments will be in this area.

# Case Histories

A plastics processor in Pennsylvania was using about 2,000 gallons per month of hydraulic oil.

The oil leaked out of the machines and was soaked up with oil dry then disposed of. The oil was costing the customer over \$4.00 per gallon.

We installed combination waste oil storage and purified oil tank. The oil recovery was over 95 percent effective, the **savings on Oil Purchases alone were over 60 percent**. The elimination of disposal costs is a bonus.

A North Carolina plastic injection molder was using over 5,000 gallons per month of hydraulic oil. The machines leaked badly, all over the plant floor! Two janitors worked full time soaking up the spills with oil dry, and then shoveling the mess into disposal bins.

We worked with the client and showed him ways to contain the spills easily and channel them to in floor sumps. We helped him design a special "wet vac" that would hold 100 gallons, but was still portable enough to move easily around the plant. We re-designed his waste oil storage and provided a 14,000 gallon split storage tank to hold both the dirty oil and the clean oil after it was purified.

The customer ended up with a plant they were proud of. The workers moral is high; the working environment is cleaner and easy to keep clean.

The company is saving almost 100 percent of the oil they use; the disposal bills have gone from a NIGHTMARE to almost nothing. **They are saving over \$150,000.00 per year in DIRECT SAVINGS.**

A plastic processor in the Carolinas was having a severe maintenance problem. The hydraulic pumps in his new machines were wearing out at a tremendous rate and he was also having serious problems with control valves.

We analyzed the oil in his machines and determined that although he was using the filters recommended by the machine manufacturer, the oil was extremely dirty. The dirt and silt levels in the machines were running up to 100 times dirtier than normal. **The oil looked visually clear, not dirty.**

We instituted a clean up schedule for the machines, we purified all the oil in each machine by hooking up to the reservoir while the machine was operating normally and flushed the oil through our equipment at over 1,000 gallons per hour **until all the oil was clean and dry.** The worn out and depleted additives were restored at the same time.

**The cost for this was LESS than 50 percent of the cost of new oil. There was NO DOWNTIME.**

This customer is now on a "preventative maintenance schedule", where every three months we sample each machine and based on the results, schedule oil purification as needed.

The maintenance cost reported to us by this customer **dropped from over \$10,000.00 per month, to less than \$1,000.00 per month.**

A medium sized company in Ontario was faced with a mountain of waste oil drums behind his plant. The Ministry of the Environment was threatening legal action because of the volume of waste oil on the plant site.

We installed storage tanks and processed all the oil from the drums into clean oil storage within three weeks. They now have NO regulatory problems and are **saving over 65%** of the previous cost of the new oil.

A large heat treating company in Ontario was having trouble disposing of the alkaline cleaning solution off its parts washers. We installed a pre-treatment system that extracted most of the oil from the alkaline solution.

The separated oil is purified by us and returned as quench oil, most of the alkaline cleaner solution is returned to the washers as make up fluid. **DOUBLE SAVINGS!**

An automotive parts manufacturer in New York State was paying almost \$1.00 per gallon to dispose of light metalworking oil from a stamping operation. The volume was in excess of 5,000 gallons per month.

We are purifying the oil on-site and refurbishing the additives for slightly more than just the old disposal cost. The new oil costs in excess of \$6.75 per gallon, the **savings are well in excess of \$200,000.00 per year.**

A large automotive parts manufacturer in Ontario had a very expensive computer operated forming press making parts for an assembly plant 200 miles away. This was a "Just In Time" operation working on an 8-hour lead-time.

A Mechanic accidentally dropped a rag into the oil reservoir; it was sucked into the pumps, which shredded it. The rag fragments kept jamming the servo valves and shutting the press down. The machine had a 2,000-gallon oil reservoir.

Our truck arrived three hours after the accident and hooked up immediately. We recirculated the oil through our equipment at over 1,000 gallons per hour for four hours before the machine was restarted.

It ran successfully. We remained hooked up for 24 hours; at which time it was determined that we had removed ALL TRACES of rag fragments from the oil.

This customer was so happy with the performance of our unit that they instituted annual purification of the oil--they have not replaced the oil in this machine for over three years now!

A rubber processor in Ohio was getting water contamination in a very heavy-duty gear reducer driving some extruders. They were concerned that the water would damage the seals on the shafts. Nobody could understand where the water was getting into the reservoir. The machines could not be shut down because of production requirements. The extruders ran a two-shift operation seven days per week.

We cleaned and dried the reservoir twice and were finally asked to come into the plant and try to find out why and how it was being re-contaminated after it happened a third time.

We observed the operation for 24 hours and found that on the midnight shift, the cleaner who worked in this area had the maintenance department electrician reverse the drive on an exhaust fan so that it blew cold roof air into the basement where he worked. The cold air was directed right on to the oil reservoir. The oil cooled rapidly, sucked moist air into the reservoir that condensed into free water. After three nights there was over 10% free water in the oil.

A specialty steel mill in Pennsylvania had the main lube oil system suddenly and mysteriously contaminated with over 5% water. Sabotage was suspected but could not be proved.

The mill had to keep running. A large mobile purification truck was pulled off a routine job and sent to the steel mill. We arrived within 8 hours of the call. The oil system was 12,000 gallons.

We were processing oil by midnight the day of the call and by 7 am the next day had the water content reduced below 0.2%. By noon the oil was CLEAR and BRIGHT, by midnight (after 24 hours processing) the water content was below 100 parts per million!

This steel mill now routinely purifies its main oil systems using our mobile equipment every year now instead of dumping and refilling with new oil.

**Savings are in the hundreds of thousands of dollars per year!**

A large aluminum extruder in the US Mid-West was using phosphate ester fire resistant fluid in the hydraulic system of a large extrusion machine. It became contaminated with water when a cooling heat exchanger perforated and leaked water into the system. The oil would cost over \$15.00 per gallon to replace, there was over 6,000 gallons of contaminated oil in the machine.

Our equipment was on-site and operating within 24 hours of the call and reduced the water to below 200 PPM within 24 hours.

**Savings were over \$80,000.00**

A small plastic extruder in Pennsylvania was using about 20 drums of oil per year and when he changed the oil in his machines just disposed of the oil.

He found out about our service and now about once per year, we stop at his plant and purify whatever oil he has accumulated in drums.

He has no disposal cost and **saves over 60%** of the cost of new oil.

A high-speed steel wire mill in Ontario experienced catastrophic failure of some water seals in its main mill lube system. The mill started shutting down due to low flow indications in the roll bearing lubrication system. **The unscheduled shutdowns were causing MAJOR PROBLEMS.**

We pulled a large unit off a job in North Carolina and also sent in one of our smaller units to get started on the clean up. The large unit arrived after 16 hours; the small unit had been processing for 10 hours at this time.

The leaking seals on the mill lube bearings were leaking 60 gallon per hour of water into the lube oil; **our equipment was removing 60 gallons per hour of water.**

We remained hooked up until the next scheduled shut down, when the faulty seals were replaced.

A major steel company in Ontario discovered that the main storage tanks for most of its mill lube systems were contaminated with dirt that had built up over the years. The dirt was being recirculated and was causing bearings problems in some of the mills.

The area was too congested to try and clean the systems using our mobile equipment, so the oil was physically removed so that the sludge layers in the tanks could be cleaned and scraped out.

The oil was purified at our fixed facility in Ontario and returned clean and re-certified by an outside laboratory 4 days later. Each tank held over 6,000 gallons of oil. **Savings over 50% of new oil cost.**

A large plastic injection molder in Michigan found that 20 of his 30 machines had particle counts well in excess of normal levels.

We were asked to provide clean up services. All 20 machines were cleaned, the additives restored and the cleanliness certified.

Each machine held between 500 and 1,000 gallons of oil. The work was finished in 48 hours.

A steel company in Pennsylvania had its large quench oil system contaminated with water due to a leaking cooler. The oil was changed twice but was still showing water contamination 8 hours after startup.

We were called in to dry the system out and investigate where the water was coming from.

Our unit dried the oil out quickly but moisture was visible in the oil as soon as 2 hours after we finished processing.

Our investigation found an air leak on the suction side of the main pump. This was allowing very wet air from the sub-basement to get into the quench oil. The high humidity was due to steam leaks from a heater next to the pump.

With the oil temperature lower than the dew point of the air, moisture was condensed out of the air and built up in the oil. The pump was pumping about 60% oil and 40% air. The leak was fixed, the oil dried out again. This system has run for two years now with no problem.

Steel company near Philadelphia was using a low viscosity special rolling oil to produce some special grades of cold rolled steel sheet. The oil was very expensive and could only be used for one week before it became too contaminated to use.

Our process cleans the oil that leaks out of the rolling mill, as well as the oil that is changed every week.

The purchases of new oil have dropped by over 80%; the **direct savings are in excess of \$100,000.00 per year.**

A large producer of extruded aluminum in Virginia was using very large quantities of hydraulic oil due to high production rates and low allowances for maintenance.

We installed two 10,000 gallon storage tanks to hold the both dirty oil and the reclaimed oil.

Our reclaimed oil has cleanliness higher than the virgin oil supplied by the major oil company.

**This company presently reclaims more than 85% of its hydraulic oil.**

**Our process Really Works!!**  
**Try us! Give us a call, or send a sample**  
**for a “No Charge” analysis.**

**1-800-263-3939**

Head Office: 640 Victoria Street, Cobourg, Ontario K9A 4W4

U.S. Sales Office: 255 Great Arrow Avenue, Unit 13, Buffalo, New York 14207