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Division of Environmental Health  
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**CITY OF ROME PUBLIC WATER SUPPLY**  
**PWS ID# NY3202405**

**FUEL OIL SPILL INCIDENT**  
**FEBRUARY 14-28, 2006**

**OCHD COMPLAINT #32-06-00010 - NYSDEC SPILL # 05-13112**

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# City of Rome Fuel Oil Spill Incident Report

## Introduction:

On February 14, 2006, the Oneida County Health Department (OCHD) received a telephone call from the Chief Operator of the City of Rome's Water Treatment Plant. The source water for the public water system had reportedly been contaminated by an accidental spill of #2 Fuel Oil.

Representatives from the OCHD and the New York State Department of Health (NYSDOH) and New York State Department of Environmental Conservation (NYSDEC) visited the facility on February 14, 2006, to investigate the reported incident.

After nearly two-weeks of intensive investigation and on-site technical response, the quick response to the water system contamination by system staff and public health representatives resulted in the elimination of risk to the public health and reduced the impacts of negative public opinion of the water source and the treatment processes of the Rome Water Treatment Facility.

It was determined that several contributing factors allowed this serious and potentially dangerous incident to occur. Lack of response to previously noted deficiencies (e.g. failure to provide adequate protection by oil storage containment or replace the heating systems with LP Gas fueled furnaces) and the breakdown in normal operating procedures (e.g. unmanned filling procedures) contributed to this incident.

Recommendations and required corrections are included in this report and will be enforced concerning several of the problems. Measures have already been taken on the part of the City of Rome to correct some of these problems and prevent any future occurrences.

## Narrative Summary:

At approximately 9:40 AM on February 14, 2006, the City of Rome had an accidental discharge of an estimated 25-30 gallons of #2 Fuel Oil (50:50 mix) into the intakes at the City of Rome's Gate House in the Town of Lee. The fuel oil is used to heat the building.

The discharge was caused by a reported over-filling of a heating oil transfer tank, followed by a leak in the secondary confinement structure around that tank allowing an estimated 25-30 gallons of the oil to flow along the floor of the intake building and into the intake chambers via uncurbed access hatches (as well as out a weep hole to the exterior of the building). Oil transfer was halted and the City of Rome's Water Department instituted its emergency plan. Within minutes, water flow to the water treatment plant was stopped and valves were closed to limit the flow of oil into the water system transmission line.

The City of Rome notified the Oneida County Department of Health and the New York State Department of Environmental Conservation within minutes of the event. Oneida County Health Department staff immediately contacted the New York State Department of Health's Central Regional Office in Syracuse and informed them of the situation.

Rome City Water and maintenance staff responded to the site to assist in the cleanup while clean-up crews were contacted. Within one hour, personnel from Eggen Environmental, was onsite and began cleanup procedures. It is estimated that 25-gallons of the fuel oil were recovered from the site (internal floor and wall cleanup, water surface cleanup and exterior snow and ice cleanup). Cleanup operations continued to limit or prevent additional product from entering the system via surface scouring. Floating booms made of oil adsorbent materials were rigged at an access chamber between the upper (tunnel) and lower (pipe) sections of the transmission system. This was done to reduce or prevent the flow of fuel oil from reaching the water treatment plant.

The City of Rome Department of Public Works formed a task force with support from the Oneida County Health Department and New York State Department of Health and its own internal staff to look at treatment techniques and procedures that could ensure the safety of the water and eliminate the presence of fuel from any waters produced by the water treatment plant. After consultation, it was determined that the addition of Powdered Activated Carbon (PAC) to the system, would provide the most effective treatment for fuel oil which had entered the intakes in the moments after the incident. Once the situation progressed, application of the PAC had occurred at all points along the treatment system (e.g. intakes, junction chamber, pre-mixing, and filtration beds).

The City of Rome received generous aid and support from the City of Binghamton's Water Department. They made available the PAC and some equipment needed to treat the water. The City of Binghamton's water treatment operator offered his aid and guidance in setting up this temporary treatment process. In addition, a CALGON Process Engineer provided specific application instructions for the use of PAC at the mixing location.

The City of Rome with the OCHD and NYSDOH developed a flexible action plan due to the ever-changing field situations encountered. Some of the steps taken in the treatment of the spill included:

- ✗ Installation of temporary PAC treatment at the Rapid Mix and at locations after the upflow clarifiers prior to filters
- ✗ Hand dosing of PAC to multiple access locations to maximize the potential for adsorption of the fuel oil
- ✗ Restart water flow in the transmission system at a lower rate than normal (4 million gallons per day (MGD) instead of 10 MGD)
- ✗ Sample water according to a schedule to determine approximate concentrations and timing of arrival of the fuel oil along portions of the system
- ✗ Install oil adsorbent booms at the access chamber along the transmission system, at the head of the filter plant, and after the upflow clarifiers prior to filtration, and after filtration
- ✗ Observations were continually made for both sheen and odor of water flowing through the system and treatment processes
- ✗ Use of Life Science Laboratories for approved sample results
- ✗ Use of INFICON field analysis equipment to determine presence of fuel oil in the water stream within minutes
- ✗ Continued sampling and observation to ensure adequate treatment

Sampling from February 15 - 23, 2006, at different locations provided critical information regarding response and treatment measures. The contaminants found in any samples collected following filtration were at levels much lower than the Maximum Contaminant Levels for the contaminants. Ultimately, through quick initial response and exceptional cooperation on the part of the Rome Water Staff, an effective Public Health response, as well as the extraordinary assistance of INFICON ([www.inficon.com](http://www.inficon.com)) and Life Science Laboratories (Syracuse) ([www.lsl-inc.com](http://www.lsl-inc.com)), this incident resulted in the elimination of all detectable spill components prior to distribution to the City of Rome's drinking water system. Fortunately, the measures taken by each agency in response to this incident protected the health of the public, reduced the contamination observed in the water filtration facilities, and ensured continued flow of quality water to the people served by the City of Rome's Public Water System.

This report includes a chronological description of events during the incident as well as problems encountered, issues to address for future incident response, and requirements and recommendations for the City of Rome to prevent future emergencies related to the Public Water System.

The City of Rome (NY3202405) serves drinking water to approximately 37,000 people within the city Service Area. In addition, the City of Rome sells drinking water to several purchase water districts:

PWS ID#	System Name	Population Served
NY3222694	FLOYD WD	1710
NY3202394	LEE WD	3150
NY3233160	MOHAWK CORRECTIONAL FACILITY	3892
NY3233173	SPENCER SETTLEMENT WATER DISTRICT	38

## Report Abbreviation Key

Abbreviation Key			
POCHD	Oneida County Health Department	MGD	Million Gallons Per Day
NYSDOH	New York State Department of Health	ppm	Parts Per Million (mg/L)
NYSDEC	New York State Department of Environmental Conservation	ppb	Parts Per Billion (ug/L)
WTP	City of Rome Water Treatment Plant	POC	Principal Organic Contaminant
PAC	Powdered Activated Carbon	DRO	Diesel Range Organic Contaminants
GAC	Granular Activated Carbon	STARS	Semi-Volatile Polycyclic Aromatic Hydrocarbons
LSL-Syracuse	Life Science Laboratories, Inc.		
Gate House	Kessinger Dam Gate House Facility		

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## Chronology of Events:

**2/14/2006 - 9:38 AM** - Antonio DiPaolo, Chief Operator of the City of Rome Water Treatment Plant (WTP) received call from Maintenance Worker at Kessinger Dam about a fuel oil spill that had entered the intake system of the City of Rome Water Supply.

**2/14/2006 - 9:45 AM** - All gates/valves closed to prevent flow of water into the transmission from the dam to the WTP.

**2/14/2006 - 10 AM** - The Oneida County Health Department (OCHD) was contacted by Antonio DiPaolo (Rome WTP) regarding a fuel oil spill at the Gate House. An unknown amount of #2 fuel oil was reportedly spilled at this location. The filter plant was shut down at 9:45AM - everything on hold regarding water use until representatives of the OCHD, New York State Department of Health (NYSDOH) and New York State Department of Environmental Conservation (NYSDEC) arrive.

**2/14/2006 - 10:15 AM** - Sean Clive, Senior Public Health Sanitarian (OCHD) contacts John Strepelis, M.E., P.E., Regional Public Water Supply Engineer (NYSDOH) to discuss problem. John will arrive ~1 PM. Joseph Robertaccio, P.E., Public Health Engineer (OCHD) and Sean Clive leave for Rome WTP and arrive at ~12:15 PM.

**2/14/2006 - 12:30 PM** - Floyd WD, Spencer Settlement WD, Lee WD and Mohawk Correctional Facility WD were notified of situation (by Joseph Patterson, Principal Public Health Sanitarian (OCHD)). They were put on hold for possible Water Conservation notice. Fred Van Namee, Oneida County Emergency Management Office (OCEMO) was notified of the situation and the potential for emergency response needs.

**2/14/2006 - 1:00 PM** - Meeting with Antonio DiPaolo (Rome WTP), John Strepelis (NYSDOH), Joseph Robertaccio and Sean Clive (OCHD), and Jim Doyle, Environmental Engineer (NYSDEC) regarding all that has occurred at the site. Information clarified regarding the spill and circumstances plus facility layout and response procedures. Exact amounts of oil spilled were unavailable due to inconsistencies with reported amounts in tanks. The following information was determined at this meeting:

The heating oil for the 2-275-gallon day tanks was being filled via the transmission line from the Kessinger Dam Guard House Facility (Guard House) where 4-275-gallon tanks are housed. The tanks at the Kessinger Dam Gate House Facility (Gate House) are connected via manifold, as are the 2 sets of tanks in the Guard House. Reportedly, at around 9 AM, the two maintenance personnel began the transmission of #2 Fuel Oil from one set of the Storage tanks in the Guard House to the Day tanks in the Gate House. The two tanks (with manifold) in the Gate House were 1/4 and 1/8 full. The tanks at the Guard House were 1/2 full. The person assigned to the Gate House reportedly left the building to plow the access areas. Around 9:35 AM, another Rome staff person arrived to check on the status of the filling and found the spill - oil had seeped through a pipe chase in the secondary containment allowing fuel to flow along the floor of the Gate House and into several access ports in the floor. (These ports are in the floor above the intake structure of the Gate House - a series of three chambers interconnected with final intake at the entrance of the tunnel.) This individual contacted the WTP to report the spill and immediately began cleanup.

The transmission tunnel from the Gate House to the Junction Chamber is 1.1 miles of tunnel hewn from bedrock shale. The transmission line from the Junction Chamber to the Treatment Plant in Lee Center, is 6.5 miles of 48-inch concrete pipe. There are no locations besides the Junction Chamber for access to the line.

John Strepelis (NYSDOH), Joseph Robertaccio (OCHD) and Antonio DiPaolo (Rome WTP) determined approximately 1.4 million gallons of water were probably "trapped" between the City of Rome's Water Intake at the Gate House and the Junction Chamber. This water would contain all of the oil that had entered the system. It was determined, assuming uniform depth and flow in the tunnel, that if the plant were placed back into service at a flow rate of 4 million gallons per day it should take between 6 and 7 hours for the oil plume to reach the Junction Chamber.

Approximate days of water reserve (with conservation):

- ✍ Floyd WD - 5-6 days
- ✍ Lee WD - 2-3 days (first problem at 56-inches)
- ✍ Spencer Settlement WD - 5-6 days
- ✍ Mohawk Correctional Facility WD - 5-6 days
- ✍ Rome City - 5-6 days

**2/14/2006 - 1:20 PM** - Sean Clive (OCHD) called Eric Lemieux (OCHD) with an update - due to prompt action by the operators, the situation seemed to be under control with the bulk of the oil contained in the Gate House building. A limited amount of fuel oil could have reached the source intake. Eggen Environmental Services is in the process of cleaning the building removing the product and assessing the extent of source contamination. At this point it does not appear a water conservation order is necessary. A final determination will still have to be made. Fred Van Namee (OCOMO) was notified and requested to make an initial contact with New York State Emergency Management Office (NYSEMO) for potential piping, pumps to make interconnections between Rome, Floyd WD and Mohawk Valley Water Authority. OCHD Staff prepared draft Water Conservation Orders. Mohawk Valley Water Authority officials were notified of the situation and were prepared to provide additional assistance if needed.

**2/14/2006 - 1:30 PM** - Hugh Guider of Life Science Laboratories (LSL-Syracuse) was contacted by responding agencies at Rome WTP regarding possibilities for sampling and analyses that are available including processing and expected turn around time. Since #2 Fuel Oil (semi-volatiles) was used (*at this time, the fuel was reportedly #2 Fuel Oil, not a mix*), no EPA Drinking Water Method analysis was available. Method EPA-8015 DRO (Diesel Range Organics) would be possible - a minimum of a four (4) hour turn around time due to the three (3) hour preparation (extraction). Primary Organic Chemicals (POC) testing would not be recommended since the product was reported as #2 Fuel Oil.

**2/14/2006 - 2 PM** - A sampling protocol was established in consultation with John Strepelis (NYSDOH). Calculations were made to determine the time of flow and amounts of flow based on water levels observed and the distances involved. It was decided to turn the water on, and sample at the Junction Chamber every three (3) hours in an effort to characterize the level and amount of contamination at the Junction Chamber. Calculation estimated a 20-hour time of travel from the Junction Chamber to the Filter Plant based upon expected flows.

**2/14/2006 - 2:30 PM** - A site visit to the Junction Chamber and Gate House sites was made to determine the extent of cleanup already accomplished and to get a first hand look at conditions at these sites. The following observations were noted:

The Junction Chamber was established as the "Critical Control Point" for observation, pre-treatment and sampling. This point became the first line of defense and observation. A multi-barrier defense and removal system was installed consisting of two lines of floating oil adsorbing booms in an attempt to capture any oil that would flow from the Gate House when the filter plant was activated.

- ✍ No sheen was observed on the surface of the water at the Junction Chamber (1.1 miles down stream (via the tunnel) from Gate House.
- ✍ Double containment was set up in the Junction Chamber consisting of two lines of floating oil adsorbent booms.
- ✍ This site was the only sampling area for water leaving the Tunnel and entering the Transmission Line.

#### Gate House -

- ✍ Water in two outer chambers of the intake (at the Gate House) were reportedly the most highly contaminated.
- ✍ Floors at the Gate House were soaked with oil.
- ✍ Some fuel oil had exited the building via a weep hole near the building entrance at the Gate House. According to on-site Eggen personnel, the product never entered Fish Creek, with all fuel oil product outside of the Gate House removed appropriately along with any contaminated snow and ice.
- ✍ A strong petroleum odor was noted in the building. The strongest odor was from the updraft from the final chamber at the Gate House (entrance to the tunnel) - OCHD staff suggested installation of a vapor extraction setup (fans) to help volatilize the fuel oil remnants on the walls of the intake chamber.
- ✍ Eggen Environmental workers at the site reported they had cleaned up an estimated 25-30-gallons of Fuel Oil from the site.
- ✍ Eggen personnel observed a very slight sheen on the surface of the water in the intake chamber at the Gate House.
- ✍ Onsite investigation showed secondary containment around the oil tanks failed due to the presence of an inadequately sealed pipe chase through the block wall at the Gate House. This chase allowed the oil feed line to feed the furnace in the Gate House.
- ✍ At this time, based upon the observation of responding personnel and their eyewitness descriptions it was believed that very limited amounts of product had entered the intake chamber - reports of maybe a few drops or a cup of product based on "drips" noted (*this estimate was later found to be inaccurate*).

**2/14/2006 - 4 PM** - Ron Heerkens, Associate Regional Director, NYSDOH Syracuse Regional Office called regarding his discussions with Jack Dunn, P.E., Acting Director, NYSDOH Bureau of Public Water Supply Protection and Rob Swider, P.E., NYSDOH. In their discussions it was recommended that 6-inches of Granular Activated Carbon (GAC) be added to the top of the water filters to adsorb any petroleum which made it to the filter plant.

**2/14/2006 - 4:30 PM** - Meeting and conference call with New York State Department of Health at Water Treatment Plant. Also present was Frank Tallarino, P.E., Department of Public Works Commissioner (City of Rome). Rob Swider (NYSDOH) offered a contact with CALGON for GAC and PAC (PAC). The CALGON office is located in Pittsburgh, PA. During this telephone conference it was estimated that in 2.5 days, the Lee Water District (population served 3,150) would have a problem with its purchase water supply since it draws water from the entrance point to Rome's Finished Water Transmission System. A quick set of calculations showed that 2-3 tractor trailers of GAC would need to be installed to cover the filters to a depth of six (6) inches. The logistics and ability to obtain and install such an amount of GAC in the 2.5-day time period appeared to be impractical.

The group then focused on the practicality of installing and feeding PAC into the water treatment system. PAC is known to remove organic chemicals (such as #2 Fuel oil) via adsorption. *[PAC is very porous. The surface area of an individual particle is reportedly very large (a single pound of activated carbon has a surface area equal to 125 acres, according to the CALGON Carbon Website - [www.clagoncarbon.com/resources/faqs.cfm#three](http://www.clagoncarbon.com/resources/faqs.cfm#three)) causing organic chemicals to bond to the surface. As these particles bond they become larger and heavier causing the particles to sink. PAC is also used to enhance coagulation. Its large surface areas and bonding potential aid in the formation of flocs, thus aiding the entire process of removing the #2 fuel oil and other organic chemicals from the water column].*

**2/14/2006 - 5-6 PM** - John Strepelis (NYSDOH) made contact with Binghamton City Water Department and determined a supply of PAC (2 tons) was available for emergencies.

**2/14/2006 - 7 PM** - During the meeting at the Rome WTP it was decided to change the sampling protocol from one sample every three (3) hours to one sample every (2) hours. This decision was made in consideration of the amount of water in the pipe, and in an effort to better characterize any plume or slug of petroleum product heading towards the plant. It was tentatively set that restart of the Rome WTP would begin at approximately noon (12:00 PM) on February 15, 2006. This timetable was set based upon the City of Rome having adequate time to install the mixing, and day tanks and chemical metering pump to be able to pump 10 ppm of PAC slurry into the water treatment train ahead of the rapid mix at the filter plant. Sampling was to begin on 2/15/2006 just before the startup of the system and continue for every two (2) hours thereafter at the Junction Chamber for eight hours (for a total of five samples).

**2/15/2006 - 4 AM** - Rome City Water staff pick up 2 tons of PAC bags and related equipment from Binghamton Water Plant.

**2/15/2006 - 10 AM** - OCHD field team arrived with Joseph Robertaccio, Sean Clive, Eric Lemieux and Louis Ferrara. Rome staff had completed most of the necessary modifications to the plant and were in the process of mixing slurry of PAC to add to water entering the Rapid Mix phase at water treatment plant. It was determined that a dosage of 330 lbs. of PAC per day could remove 5-gallons of #2 Fuel Oil, the most oil which was believed to have escaped into the intake tunnel at the time of the spill. According to discussions with Bill Arndt, CALGON's Chemical/Process Engineer, the City of Rome needed a dosage of 10ppm to treat 5-gallons of Fuel Oil. The slurry mix was determined to be 1 pound of PAC to one gallon of water. Chemical feed lines in the water treatment plant were already in place, and a chemical feed pump was being fitted to inject the carbon slurry. This mixing was facilitated within a 150-gallon plastic tank located in the garage of the Filter Plant. This was done to minimize both the mess inside of the filter plant area and to reduce an explosion hazard which can exist due to aerosolization of the fine (40 micron on average) carbon particles which make up the PAC. The slurry is then transferred via pump to a 150-gallon day tank with stirrer to keep the slurry in solution. From there the water is pumped via a chemical feed pump directly into the head of the plant in front of the rapid mix.

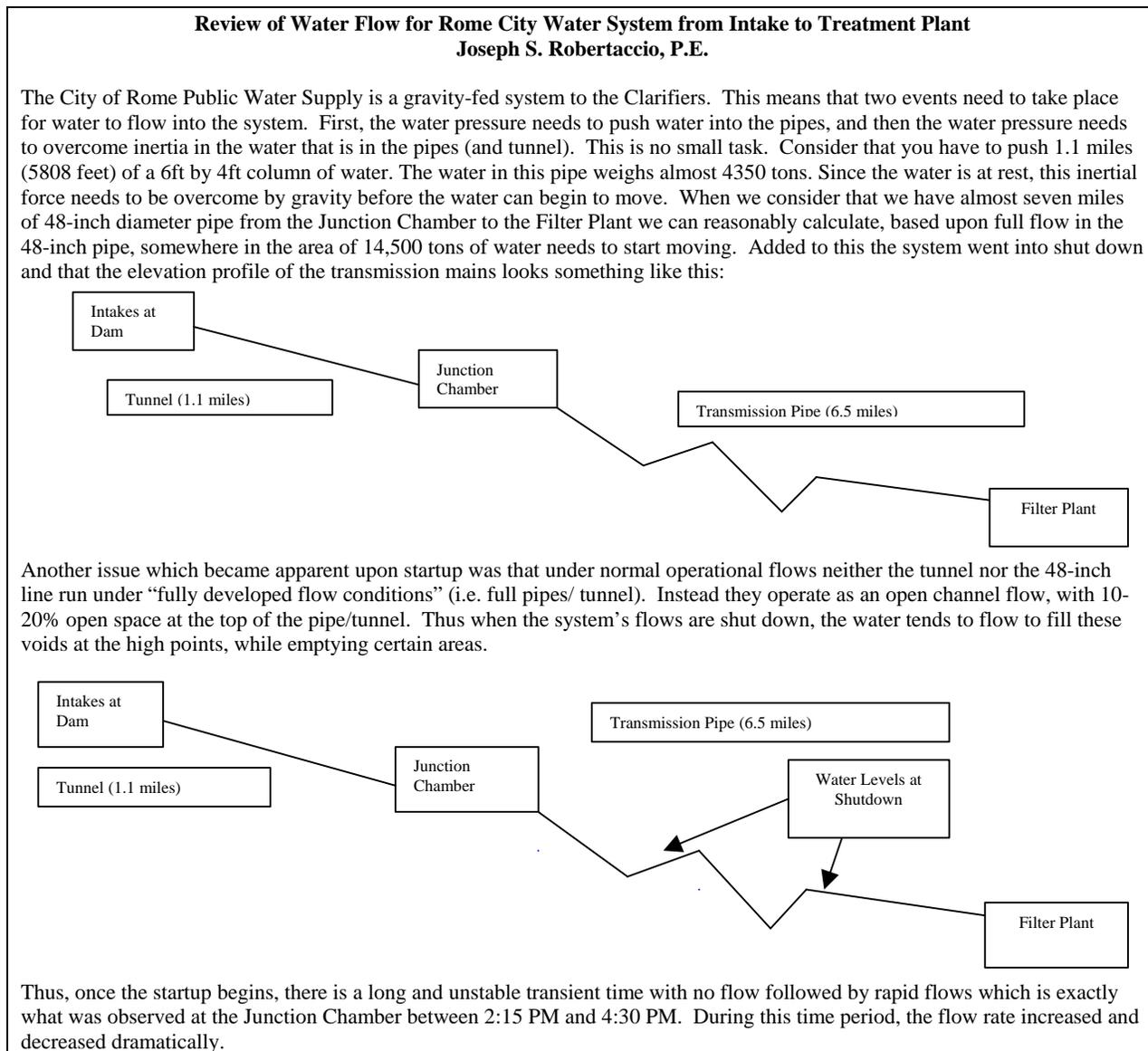
**2/15/2006 - 1 PM** - Rome WTP is ready to restart with PAC injection at Rapid Mix chamber to remove organic chemicals.

**2/15/2006 - 1:30 PM** - Ron Heerkens (NYSDOH) calls regarding changes in recommendations for treatment and sampling from the Bureau of Water Supply Protection (BWSP). The NYSDOH strongly urged the City of Rome to have discussion with LSL-Syracuse requesting Lab staff stay overnight to process Rome's samples. After discussions with LSL-Syracuse it was found this was impossible for the evening of February 15, 2006. By 2:00 PM, the logistics of sampling, bottles and delivery had been worked out and the plant was ready for restart.

**2/15/2006 - 2:15 PM** - The first grab sample (0 hours) was collected at the Junction Chamber. This sample was from surface water in front of the oil adsorbent booms. This was done to represent the worst case scenario of what was coming down the tunnel. The Rome WTP started up with PAC slurry treatment injection at a dosage of 10 ppm prior to the rapid mix chamber. The intakes at the Gate House were opened to 16% of full flow starting the flow process. The gate valve at the Junction Chamber was also opened at the same time establishing flow to the water filtration plant about 6.5 miles away. Simultaneously the filter plant was placed online with a demand of 4 MGD. For over one hour no visible water flow movement was observed at the Junction Chamber.

**2/15/2006 - 2:30 PM** - The valve at the Gate House was opened an additional 2% (total of 18% of full flow).

**2/15/2006 - 3:00-3:30 PM** Extreme flow variability and turbulent flow observed at the Junction Chamber. It was assumed at the time that this was the result of suction from Transmission Line and additional flow from Tunnel. It was later determined that the settling of water along the Transmission Line when the flows to the Water Treatment Plant were shut-down caused the suction. The Transmission Line is not a consistent gradient, so air pockets were filled and some air ended up at the upper reach of the line opening voids or empty pipes that the water rushed to fill. The "burping" of the pipes for several hours after start-up further supported this theory.



**2/15/2006 - 4:00 PM** - While meeting at the Junction Chamber, Joseph Robertaccio (OCHD) proposed using a fishing bobber as a flow tracer. The fishing bobber would be inserted into the Gate House intake chamber to aid observers in the visual determination of when water from the Gate House intake chamber reached the Junction Chamber. When the bobber arrived, you could be sure turnover had occurred in the tunnel's water. Fishing bobbers were chosen since they were cheap, readily visible and floated on the surface of the water just like any oil would. Antonio DiPaolo (Rome WTP) indicated that there was 17-feet of water in the Gate House Intake Chamber above the top of the Tunnel ceiling. A depth of 17-feet or 8-feet (conflicting reports) between the free water surface and the intake to the tunnel would have prevented any floating oil from contaminating the Tunnel water. After conflicting memories and discussions on this matter, Mr. DiPaolo left for the WTP to retrieve the engineering plans for the Kessinger Dan Facility to double check these facts.

**2/15/2006 - 4:00 PM** - A telephone conference was conducted onsite at the Junction Chamber between NYSDOH representatives in Syracuse and Troy, OCHD staff onsite, and City of Rome Water personnel. The purpose of these discussions was to determine what

additional information had come to light in the intervening hours and to clarify what were the next steps in response. During these discussions, information evolved in a very dynamic environment. While this teleconference was going on the water went through its transitory stages and conflicting information as to the water level of the entrance to the tunnel at the time of the incident was sorted out.

**2/15/2006 - 4:15 PM** - No odor or sheen noted in Junction Chamber. Regular Flow observed. Sample #2 collected (2 hours).

**2/15/2006 - 4:30 PM** - Fuel odor was observed and sheen observed within minutes. City of Rome personnel retrieved bags of PAC from the WTP to facilitate pre-treatment via adsorption by hand dosing PAC at the Junction Chamber on the advice of Joseph Robertaccio (OCHD). At this point the group observed the oil adsorbent floating booms were containing the oil, preventing or limiting downstream flow. This was accomplished by dumping approximately 2 liters of PAC on the water surface. Upon observation one could see the activated carbon actually adsorbing the oil and eventually sinking deeper into the water column. Also personnel from Rome Water suggested that they should also dose a "slug" of activated carbon into the intake structure to float down the tunnel so as to "scavenge" and treat any oils trapped between the intake and the Junction Chamber.

At the same time this was occurring, telephone conferences were being held with NYSDOH and OCHD staff, the tunnel "turned over" (that is the water from the intake structure reached the Junction Chamber) and a distinct fuel odor and sheen were observed entering the Junction Chamber. In short, it was determined that:

1. Oil had entered the intake tunnel (see 4:30 PM notes for more),
2. The water levels at the Gate House are controlled by a butterfly valve between chambers and, that the valve was set to allow water at full flow - at which level the ceiling of the tunnel was exposed.
3. The engineering plans supplied of the chamber structure at the Gate House indicated that the top of the tunnel was approximately 17-inches below the free water surface under rapid flow conditions, but this drops over 17-20 inches under dynamic flow conditions.
4. Continued sampling and observation were necessary. In addition, NYSDOH strongly recommended a Water Conservation Notice as soon as possible.

From field calculations it was expected to take approximately 20 hours for water from the Junction Chamber to reach the Rome WTP. This gave an expected time of arrival of the main oil plume to the WTP at about 12:30 PM on 2/16/2006. [*Subsequent readings of the particle counter at the intakes at the City of Rome's Filter Plant indicated the oil plume actually entered the plant at 2:14 PM on 2/16/2006*]

**2/15/2006 - 5:00 PM** - Hand dosed Junction Chamber with PAC. Personnel present witnessed reaction/adsorption of PAC and pink tracer coloration.

**2/15/2006 - 5:30 PM** - Fishing bobbers added to Gate House intake chamber and also into the tunnel inlet chamber. The water in the inlet chamber reportedly did not show any movement. The bobber in the tunnel inlet chamber moved a bit, and subsequently flowed down the tunnel to the Junction Chamber where it was retrieved on 2/16/2006 during cleaning and oil boom change operations at the Junction Chamber.

**2/15/2006 - 6:00 PM** - Rome water treatment plant staff hand dosed Gate House intake chamber with PAC.

**2/15/2006 - 6:15 PM** - Collected sample #3 (6 hours) from area on Tunnel side of PAC treated water in the Junction Chamber (*this sample was dropped and broken later in the night*). Sean Clive, Lou Ferrara, Eric Lemieux (OCHD) left site for home. Joseph Robertaccio (OCHD) remained with Rome WTP staff to observe sampling and PAC dosing.

**2/15/2006 - into evening (Joe Robertaccio with ROME WTP staff) until 10:30 PM** last sampling time at Junction Chamber. After each sample collection the Junction Chamber was dosed with PAC. Observation of water in Junction Chamber showed a continuous sheen on the water surface over these hours. At approximately 8:00PM it was noted more of the PAC was reacting/adsorbing with the petroleum, making those present suspect that the greatest concentration of petroleum was then passing through the Junction Chamber. The 8:16 PM sample seemed to confirm this observation. The oil boom through the evening became covered with PAC, however, the staff present were confident they had stopped the majority of the oil at this point. Mr. Robertaccio remained with Rome WTP staff throughout the sampling period. After each of the samples were collected additional PAC was added to the water surface to facilitate additional spot treatment.

The following is a summary of samples collected at the Junction Chamber and notes on the samples:

Time	Observations
2:15 PM (0 hours)	Startup - no oil or sheen observed
4:15 PM (2 hours)	No Oil
6:15 PM (4 hours)	Oil observed - Sample Broke in transport
8:15 PM (6 hours)	Oil - glob - 1" diameter by 3/8" thick
10:15 PM (8 hours)	Oil - glob - 1/8" diameter

At approximately 9:30 PM a change in how the carbon was acting was observed. Previous to this time the carbon was seen floating on the water surface adsorbing the oil and sinking into the water column. At 9:30 PM this changed with the carbon sinking much more rapidly. This process appeared to be different from that previously observed, and Mr. DiPaolo (Rome WTP) noted it had the appearance of the PAC slurry made at the plant. This observation has some merit when one compares the size of the oil globs at 8:15 PM and those at 10:15 PM. It is very possible the main plume had basically reached this point and become trapped and treated.

**2/16/2006 - 8:30 AM** - Joseph Robertaccio (OCHD) left for the Rome WTP. Sean Clive remained at the OCHD offices to collect information and start report, John Strepelis (NYSDOH) was scheduled to finish EPA training in Batavia, NY and planned on proceeding to the Rome WTP that evening.

**2/16/2006 - 10 AM** - A dip sample was obtained from the Junction Chamber prior to cleanup and a 1/64-inch thick layer of free-floating product was observed by Mr. Robertaccio. Eggan Environmental removed floating product (via wet vacuum) and carefully changed the existing booms with new booms. The Rome WTP has sample taps in the plant laboratory for: Raw Water (pre-Rapid Mix), Sedimentation Basin, and Composite Filtered Water - these sample locations will be used in the afternoon / evening sampling. Through this period the PAC was added as a slurry before the rapid mix chamber at 10 ppm concentration.

**2/16/2006 - 9:07 AM** Paper copy results received from Rome WTP:

Sample Results for 2/15/2006 samples:

Sample Time	Result	Sample Time	Result
0 hour (2:15 PM)	98 ppb DRO (Diesel Range Organics) (76% Recovery of Surrogate)	6 hour (8:15 PM)	510 ppm (62%R)
2 hour (4:15 PM)	140 ppb (69%R)	8 hour (10:15 PM)	59 ppm (44%R) low Surrogate recovery - "Sample may be biased low"

\*4 hour sample bottle broken due to ice and snow at sample location.

**2/16/2006 - 12 PM** Telephone report from Joseph Robertaccio (OCHD) indicated the presence of odor in the water samples that had been collected the night before in front of the double booms and before PAC was dosed into the Junction Chamber. The main slug of contamination was expected to hit the WTP at any time now [*actually hit at 2:13 PM from information gained from the particle counter which saw a drastic reduction of particles coming into the plant*]. Additional water sample bottles were on their way from LSL-Syracuse. The Junction Chamber observations from late 2/15/2006 noted some additional sheen on surface of water before booms but not after booms. Mr. Robertaccio (OCHD) had requested that PAC be hand dosed every 30-minutes at the Gate House to try to remove small pockets of oil trapped in the tunnel. Raw water flow at the WTP sink showed no noticeable sheen or odor at this time - all present continued vigilant watch of water. Since there is still product in the Junction Chamber, the dosing of PAC at the Gate House was doubly warranted.

The following is the Sampling Procedure recommended by the New York State Department of Health based upon consultation with Joseph Robertaccio (OCHD) at the WTP. This sampling time frame will incorporate the estimated arrival time of the initial product + follow the natural progression through the 6 hour process through the system and parallel to a certain extent, the spiking of the initial samples.

- ✍ At 1 PM (23 hour) when bottles arrive, collect (VOC) samples from intake (raw water pre-treatment) and from Sedimentation Basin outflow as baseline. Continue sampling at 4 PM (26 hour), 7 PM (29 hour), and 10 PM (32 hour).
- ✍ At 7 PM (29 hour) and 10PM (32 hour) collect additional EPA-8015-DRO samples from Raw and Finished (combined filter) water.

**2/16/2006 - 1 PM** - Conference call between with New York State Department of Health (Ron Heerkens, Jack Dunn P.E., Rob Swider P.E.) and Sean Clive (OCHD). In this teleconference, the following procedures for 2/16/2006 sampling and plant operations were set:

A. Sampling Required -

- ✍ 2:30 PM (24 hours) - POC+TAGM (DEC Pet. Contaminated Soil analysis) sample and DRO sample from 1-Raw water pre-PAC addition at Rapid Mix; 2-Pre-filters (post Sedimentation Basin); 3-Finished Combined Filter Effluent
- ✍ 4:30 PM (26 hours) - POC+TAGM sample and DRO sample from 1-Raw water pre-PAC addition at Rapid Mix; 2-Pre-filters (post Sedimentation Basin); 3-Finished Combined Filter Effluent
- ✍ 6:30 PM (28 hours) - POC+TAGM sample and DRO sample from 1-Raw water pre-PAC addition at Rapid Mix; 2-Pre-filters (post Sedimentation Basin); 3-Finished Combined Filter Effluent
- ✍ 8:30 PM (30 hours) - POC+TAGM sample and DRO sample from 1-Raw water pre-PAC addition at Rapid Mix; 2-Pre-filters (post Sedimentation Basin); 3-Finished Combined Filter Effluent

B. Plant Shut-down at 8:30 PM following last sample to prevent any untreated product from entering filters if not already there - plus, maximize PAC adsorption of product.

C. Immediately (1 PM) Increase PAC addition at Rapid Mix from 330 # / day (10 ppm) to 660 # / day (20 ppm) unless CALGON Process Chemical Engineer indicates this would be a bad idea. If OK, increase would occur immediately.

D. Add an additional Boom at the Weir of the Sedimentation Basin.

E. Visually observe and smell surface of water at - Sedimentation basin, + Raw Water, and all process locations. Determine potential location of PAC treatment ahead of filters.

F. Contact Life Science, 1 - Hugh Guider will drop off additional bottles as needed to sample through 8:30 PM sampling (recommend many more for additional sampling); 2 - Plead with lab to stay into night to analyze samples - OT for lab people may be necessary; 3 - Rome WTP staff will drop samples as they are collected. If the after-hours does not work, samples will be dropped off 1st thing on Friday for 6 AM start-up analysis of all samples.

G. Inform LSL-Syracuse that NYSDOH contacts Ron Heerkens and John Strepelis (fax - 315-477-8588) and Sean Clive, Joe Robertaccio, John Dunn, Nick DeRosa, Eric Lemieux (OCHD - fax - 315-798-6486) must be sent information re: sample results directly.

H. Conservation Order Needed IMMEDIATELY + Public Release regarding issue. Ron Heerkens NYSDOH contacting Nick DeRosa re: issuance of notification. VERY IMPORTANT given the possibilities of water shortage problems and amount of product observed in Junction Chamber. NYSDOH ready to order OCHD to issue Press Release and Public Notification.

I. After sample results are obtained, review will determine when plant is allowed to continue operations and future action (e.g. additional PAC, flow to waste, etc...).

**2/16/2006 - 1:30 PM** - Discussion with Hugh Guider (LSL-Syracuse), Primary Organic Chemicals (POCs) and TAGM (NYSDEC Petroleum Contaminated Soils) list recommended for the samples due to the presence of Kerosene in initial samples. Determined the Fuel Oil was actually a 50:50 mix to prevent freezing (not the reported #2 Fuel Oil). If greater than 20 samples collected the lab will have difficulty completing analysis within 24 hours. Will look into splitting with OBG lab. Coordination by Rome City needed to request LSL-Syracuse for overtime sampling, bottles, etc... and results sent directly to OCHD and NYSDOH.

**2/16/2006 - 2 PM** - Report from Joseph Robertaccio indicated the following:

- ✍ Initial booms collected from Junction Box were reportedly saturated with at least 5-gallons of fuel oil product.
- ✍ These booms at the Junction Chamber were replaced, hand dosing of PAC being added at Gate House.
- ✍ A bail sample collected had approximately 1/64-inch of free floating product on surface of water at Junction Box.
- ✍ The Gate Valve at the Junction Chamber is set at 2-3 inches below water surface; this acts as additional barrier to surface flow of floating oil product. It is unknown if any product had exited the Junction Box below the gate valve.

Currently, Eric Lemieux and Joseph Robertaccio (OCHD) are at the Rome WTP. Sean Clive (OCHD) discussed the procedure outlined by NYSDOH (*see above*) with Joseph Robertaccio (OCHD). Mr. Robertaccio reviewed the NYSDOH procedure with Mr. DiPaolo (Rome WTP). Mr. DiPaolo believed a shut down could create significantly greater problems than the oil represents. Rome had an estimated 1.8 days of effective storage before problems would start for Lee WD.

**2/16/2006 - 3 PM** - Procedure for 2/16/2006 faxed to Rome WTP and emailed to NYSDOH. Mr. Robertaccio reviews the plant's online data records. The Raw Water Particle Counter has shown a significant drop. The monitoring software since restart has been "pegged" at 4880 (its maximum reading - due to PAC addition) then starting at 2:14 PM on February 16, 2006 it begins a steep drop to 3300. Mr. Robertaccio realizes the carbon particles in the water are adsorbing the oil, thus the oil has already reached the WTP.

**2/16/2006 - 3:30 PM** - Telephone conversation between Mayor Jim Brown (Rome) and Joseph Robertaccio (OCHD) regarding NYSDOH Procedure. Mayor notes City needs WTP back online. Wants to know with whom he needs to talk regarding additional NYSDOH assistance - labs, etc... Mayor considering speaking with Governor's Office to get more state assistance. Mr. Robertaccio suggests an attempt at contacting INFICON of Syracuse for field analysis. [*INFICON is a regional company that makes portable Mass Spectrometer and Gas Chromatograph laboratories for the Department of Defense, Home Land Security for mobile application with results available within 17 minutes.*] Mr. Robertaccio with the Assistance of Mr. Clive gives telephone number to Mayor Brown. Mayor Brown contacts INFICON, and within 15 minutes, INFICON is dispatching personnel and equipment from the factory in Syracuse to the Rome WTP. Estimated time of arrival is between 6 and 7 PM.

**2/16/2006 - 4:40 PM** - Telephone call from Ron Heerkens (NYSDOH) to Mr. Robertaccio (OCHD) regarding current status and updates - specifically regarding his findings from the particle counter and informs Mr. Heerkens that INFICON is sending portable mass spectrometer and gas chromatograph to support operation. Mr. Heerkens is adamant that shutdown of the plant needs to take place at 8:30 PM. Mr. Robertaccio (OCHD) and Mr. DiPaolo (Rome WTP) strongly disagreed, noting the oil plume has apparently already reached the WTP, and disruption of the process could lead to contamination of the plant and bigger problems than running it.

**2/16/2006 - 5 PM** - John Dunn, Interim Director of Environmental Health relieves Sean Clive (OCHD) and visits Rome WTP to provide assistance from OCHD standpoint (re: Water Conservation Notice, sampling, plant shut-down). The following is John's brief of 2/16/2006 site issues for Nicholas DeRosa:

*"On Thursday, February 16, 2006, I went out to the Rome Water Treatment Facility on Stokes-Lee Center Road at approximately 6:00 PM. Joe Robertaccio and Eric Lemieux were there along with Mayor Jim Brown, DPW Commissioner Frank Tallarino and several staff members from Rome Water Department. There were also three people from INFICON Corp. who were conducting rapid field testing for VOCs.*

*I immediately spoke with Joe and Eric to determine the current state of the situation. I was told that the oil slug had reached the facility at approximately 4 - 4:30 PM and was approaching the settling basin. I went out with Eric and Tom Andrews (Rome Water) to sniff the hatches. There was an apparent odor of oil from the hatch above the rapid mix tank, and the odor became fainter at hatches approaching the settling tank.*

*INFICON was in the process of testing raw, settled and finished water, and so far only showed hits in the raw water.*

*I spoke with Mayor Brown and DPW Commissioner Tallarino as well as Rome Corporation Council James Rizzo (on the phone) about the immediate need for public notification and whether or not the facility would be shut down at 8:30 PM. After discussion, it was decided that Mayor Brown would immediately put out a public statement about the situation and request residents to conserve water. Mayor Brown would also contact the affected purchasing districts to personally notify them of the situation. We were able to craft a release and it went out at approximately 10:00 PM*

*In the aforementioned conversation we also discussed whether or not the facility should be shut down. Both the Mayor and the DPW Commissioner were strongly opposed to the State's recommendation to shut down at approximately 8:30 PM, since this would likely cause a water outage for some purchasing districts as well as insufficient fire protection capacity for Rome and Lee Center. I asked the Mayor to await the arrival of John Strepelis from NYSDOH (arriving at 7:30 PM) and consider the collaborative recommendation of John and Joe Robertaccio, once John became aware of the current status. When John Strepelis arrived, a conversation began which led to the decision to continue operation of the facility through the night. In order to meet the demands, the facility was also slowly increased to a flow of 6 MGD from their current rate of 4 MGD.*

*Samples were collected for laboratory analysis at 2:30 PM, 4:30 PM, 6:30 PM, and 8:30 PM. Hugh from Life Science Laboratory came to pick up all of the samples at 8:30 PM and explain that results would be ready by Friday morning approximately 9:00 AM*

*It was estimated that the majority of the oil slug would hit the facility around 11:00 PM. At 11:00 PM, John Strepelis and I grabbed samples from the hatches over and near the settling basin to be run by INFICON. When these samples showed hits, a sample was taken immediately from the top of the filter. This sample also showed low levels of VOCs including toluene and xylene. The decision was made to continue operating the facility even though product was now getting into the filters, but to begin adding PAC ahead of the filters. The levels were very low and it was determined to be the best course of action at the time.*

*I left the facility at approximately 12:15 AM, and Joe R. and John S. were planning on staying through the night. I went back to the plant at 8:00 AM this morning to get an update on the status. INFICON had found low level hits of VOCs at the filter and beyond. However, throughout the early morning hours, these hits were lessening as the water quality was improving.*

*My involvement in this situation has been sporadic, and these observations should only be added to a full account provided by Joe Robertaccio."*

**2/16/2006 - 7:00 PM** - Arrival of INFICON personnel with three (3) portable mass spectrometers and gas chromatographs. It took them approximately 1 hour to set up their equipment and calibrate. They then went to have dinner and returned about 10:00 PM after first running a couple of samples.

**2/16/2006 - 7:30 PM - 2/17/2006 - 8:00 AM** - At 7:30 PM John Strepelis (NYSDOH) arrived and spoke with Mr. Robertaccio (OCHD) and Mr. DiPaolo (Rome WTP). At this point the parties jointly entered into a quick risk assessment of the situation which remained dynamic throughout the evening.

The first order of business was to assess the risks of shutdown of the plant versus the risk of continued processing of the water:

- ✗ To properly assess the risk we had to consider the amount of time the oil apparently had already been in the sedimentation chamber (6 hours), the nature of the process (rapid mix followed by mechanical flocculation) and what interruption of the process would do. The greatest risk here was a shut down of the process. This event would not facilitate the mechanical mixing of water, which causes collisions between oil particles and PAC, thus possibly allowing free floating product to contaminate the surfaces of the settling basin.
- ✗ We had to look at the process time for us to move the contaminated water through the plant at the 4 MGD flow rate. With the settling basin having 2 million gallons of capacity, this translated to a 12-hour turnover time. In other words, it was 12 hours between water entering the settling chamber and leaving the settling chamber. Thus the plume of contaminated water which had started entering the plant at 2:13 PM on 2/16/2006 would ideally leave the settling basin at 2:13 AM on 2/17/2006. Considering possible "short circuiting" in the settling basin we could expect the first of the treated contaminated water to leave the settling basin between 11:00 PM and 2:30 PM.
- ✗ We had achieved operation awareness and process control capability in this situation with the arrival of INFICON's sampling units and their 15-minute turn around time. Although these chemical analysis results are not admissible in court, their accuracy appears to be satisfactory to a number of government agencies, and thus they can be considered a reasonably reliable technology. This offered a Best Available Technology (BAT) assessment tool that is reasonably accurate in the hands of a skilled operator.
- ✗ The nature of illness associated with the maximum contamination levels for these chemicals is based upon a chronic (long-term) exposure at these levels, not a short-term exposure. Thus this has a low risk to the public at large.
- ✗ We had to consider the time lag between traditional chemistry sample submissions (minimum of 12 hours even though LSL-Syracuse did stay open throughout this night supporting us with timely sample results) and the need and risk of not producing water (Lee Water District without water for 3,150 customers under worst case scenario).
- ✗ Based upon the experience of CALGON's Chemical Engineer, and the experience of the City of Binghamton's Water Treatment Plant Operator with similar contamination removal processes, we felt their professional expertise and insights and calculations could be justly trusted.
- ✗ The presence of approximately 40 million gallons of uncontaminated, finished drinking water in Rome's 65 million gallons of open water storage. This offers a dilution factor of 20:1 to 60:1 (depending upon the filling rate of the finished water reservoirs) to dilute any "spikes" in chemical not fully treated out by the treatment process.
- ✗ The current readings on the particle counter. They were at their lowest levels at this time indicating the main part of the plume was entering the plant.
- ✗ Finally, we looked at what process changes could reasonably be instituted within 12 hours of our receiving detailed chemical analysis and results from LSL-Syracuse. Basically none (we would need greater than 12 hours to get the 2-3 tractor trailer loads of GAC to put 6 inches onto each of the filter beds). Add to this the time for labor to facilitate this task, it was impractical to add any other effective removal methods in the time frames involved.

***Based upon the risk assessment, Mr. Strepelis and Mr. Robertaccio concurred that shutting down the water plant offered a greater risk than treating the water when all other factors were duly weighted with good professional judgement and experience. The Plant was to be run at 4 MGD until morning.***

This risk assessment was modified through the night, due to developing weather conditions and the threats they posed (*see below*).

**2/16/2006 - 9:00 PM** - Floating oil booms were added as an additional line of defense to the top of the upflow clarifiers. Originally it had been proposed that this oil boom be extended over the outfall weir of the setting basin. However, if one of these oil booms were to break free, they could damage the low lift pumps into the filters, basically disabling the plant. Based upon the risk (it would take possibly weeks to get new impellers) this action could have on the system, it was decided to put the oil boom on top of the upflow clarifier outfall.

**2/16/2006 - 8:00 PM -2/17/2006 - 6:00 AM** - Hourly inspections were conducted at the rapid mix chamber, paddle mixing station, and hatches on the clarifier and settling basins. Odors were assessed for strength. Dip samples were collected for smell testing. The

top of the upflow clarifiers were inspected for oil sheen, and results from INFICON's units were analyzed. This allowed us to track the movement of the slug of petroleum product through the process and assess the success of our treatment processes.

**2/16/2006 - 10:00 PM - Revision of Risk Assessment.** At 10:00 PM while monitoring television news channels for the press release requesting water conservation, a National Weather Service Emergency Alert System message scrolled across the bottom of the television screen. This notice indicated that winds of over 70 miles per hour were expected to hit the region before noon on Friday February 17, 2006. Mr. Robertaccio and Mr. Strepelis met with Mr. DiPaolo to discuss. Rome has not yet installed emergency electrical generating capacity as required under the Oneida County Sanitary Code. Thus a power outage, with the approach of near hurricane force winds, was quite possible. In consideration of this risk it was decided that production at the plant needed to be increased much earlier than previously expected. The plan was changed to increase production during the evening hours towards full production by morning based upon the information from INFICON's laboratory units. Production was increased at 12:00 AM (from 4 to 6 MGD at 0.5 MGD per 30-minutes) because the water levels in the reservoirs were still dropping. In anticipation of the increased water consumption in the morning and the possible power loss due to the impending windstorm, production was incrementally increased to a flow of 12 MGD by 6 AM.

It was also noted that the windstorm may offer a unique opportunity to use the wind action to facilitate both mixing of the water and aeration in the large open reservoirs, thus we hoped to use it to our best advantage in dilution and volatilization of any organic chemicals which made it though the filter plant process.

**2/17/2006 - 2:00 AM** - With the increased production it was found that the crisis occurred at approximately this time. INFICON found levels of Primary Organic Chemicals (POC) exceeding the minimum standards set in Part 5 of the New York State Sanitary Code of Drinking Water. However, these levels only slightly exceeded the maximum contamination levels (by factors of 2 or less) and considering the dilution factor (20:1 to 60:1) both engineers and water treatment plant operators present felt confident that the water would meet Part 5 Standards when it eventually entered the City's Distribution system.

**2/17/2006 - 4:00 AM** - Trending of filtered water by INFICON (See Appendix E) showed a consistent downward trend of POC concentrations in the combined filtered water effluent. This trend indicated the worst had passed and testing of influent water was in the low ppb range (at about 10:00 PM the previous evening the water at the rapid mix tank was coming in at parts per million). Additional filters were put online to process more water due to the impending windstorm. It was decided that as flows increase, the PAC feed rate would be kept constant. Consequently, as flow rate increases the overall concentration of PAC is reduced.

**2/17/2006 - 6:00 AM** - The Plant was set at 12 MGD in an effort to stock pile reserves of water in reservoirs (and also to aid in dilution of a couple hours of maximum contamination level exceeded waters.

**2/17/2006 - 7:00 AM** - Water Operators open covers on settling chamber to air out volatilized organic chemicals trapped in the air in the chamber.

**2/17/2006 - 7:30 AM** - Inspection of Junction Chamber by John Strepelis (NYSDOH) and Joseph Robertaccio (OCHD) and Antonio DiPaolo (Rome WTP). They find oil still coming down from tunnel.

**2/17/2006 - 8:20 AM** - John Strepelis (NYSDOH) calls Ron Heerkens (NYSDOH) and updates him on the current status. John follows up with a telephone call to Jack Dunn, and updates him on the current status and situation.

**2/17/2006 - 9:20 AM** - The Windstorm strikes. Power flickered many times over the course of the morning.

**2/17/2006 - 11:00 AM** - WTP returned to modified (still adding PAC) normal operations. Site secured from emergency operation conditions. Based upon observations over next week, a time to stop feeding PAC will be determined. Mr. Robertaccio and Mr. Strepelis leave site for home.

**2/18/2006** - John Strepelis (NYSDOH) discussed several issues with Rome WTP staff including sampling for the next few days, increasing flow, and decreasing PAC injection dose to 2 ppm. Sean Clive (OCHD) discussed issues with Ron Heerkens and John Strepelis.

**2/20/2006** - John Strepelis (NYSDOH) and Sean Clive (OCHD) discuss issues and sampling results. Samples collected from the following (results at 3:30PM, 2/21/2006) - Fish Trap Building (water for distribution) - POCs = ND, NYSDEC STARS 525.2 Base/Neutrals = ND; Junction Chamber - POCs = ND, NYSDEC STARS 525.2 Base/Neutrals = ND; Supernatant Water - POCs = ND, NYSDEC STARS 525.2 Base/Neutrals = ND. Therefore, all samples showing up good. Additional samples requested for Tuesday (2/21) - Thursday (2/24).

**2/21/2006** - Sample results received for 2/20/2006 samples. Continued sampling at Fish Trap Building needed daily.

**2/22/2006 - 1:00 PM** - Meeting at Rome WTP with John Strepelis (NYSDOH), Joseph Robertaccio and Sean Clive (OCHD), Antonio DiPaolo and Mike Barbato (Rome WTP). Next steps - Settling basin observed - slight odor. Junction Chamber observed - slight odor, some sheen - though small and inconsistent. Continue sampling - continue PAC addition. Flow was at a maximum of 14 MGD, and would be reduced soon, once reservoir levels reached normal operating levels. Conservation order indicated no reduction in water flows except for Mohawk Correctional Facility. OCHD staff saw very little media coverage of the issue.

**2/23/2006** - Last sampling at Fish Trap, Raw Water and Supernatant - replaced booms at Junction Chamber (*according to Eggan Environmental, booms had no PID readings, no Oil, no POCs, etc...*). No contamination observed - no sheen, no odor.

**2/24/2006** - Last information received - PAC continued 2 ppm - no product in boom. LSL-Syracuse initial results indicated presence of two contaminants - John Strepelis (NYSDOH) discussed this with the Lab Technician, who indicated the results were actually typical laboratory error. Revised results would be forwarded as soon as possible.

**2/27/2006** - Initial results from Fish Trap building indicate presence of 2 semi-volatile compounds. After consultation with LSL-Syracuse, the results were incorrect and were reported as an analytical error. All samples were free from any contamination. No additional samples were required, and no additional action was needed. PAC addition must continue at 2 ppm.

**3/2/2006 - 1:20 PM** - Joseph Robertaccio and Sean Clive (OCHD) visited the site to determine current conditions and consider future action. Received "revised" sample results for 2/23/2006 sampling. It was also determined that no additional product was in the Junction Chamber. No odor or sheen were present, therefore, no additional action was necessary. Rome will call Eggan to remove the booms from the Junction Chamber. No additional replacements are necessary. Rome is working to do the following:

- ✗ Install new fuel system to heat the Gate House. LPG tanks will be located at the Guard House. Once the weather is adequate for work at the site, the replacement will begin.
- ✗ System will develop SOPs and ensure that any procedure requiring observation is carried out as necessary.
- ✗ Additional actions will be taken.

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## Conclusions and Recommendations:

### Conclusions:

After nearly two-weeks of intensive investigation and on-site technical response, the quick response to the water system contamination by system staff and public health representatives resulted in the elimination of risk to the public health and reduced the impacts of negative public opinion of the water source and the treatment processes of the Rome Water Treatment Facility.

It was determined that several contributing factors allowed this serious and potentially dangerous incident to occur. Lack of response to previously noted deficiencies (e.g. failure to provide adequate protection by oil storage containment or replace the heating systems with LP Gas fueled furnaces, and failure to protect the access hatches), and the breakdown in normal operating procedures (e.g. unmanned filling procedures) contributed to this incident.

Although the City of Rome Water System personnel responded quickly and effectively to the contamination incident, and despite the outstanding efforts of the responding agencies to limit the extent of contamination and reduce or eliminate the risk to the public health, the entire event could have been prevented.

Had the City of Rome taken measures to eliminate the vulnerabilities exposed by the fuel delivery system at the Gate House, explained in both the Vulnerability Assessment and the January 2003 Comprehensive Performance Evaluation (CPE) Report, the incident could have been prevented. The CPE General Recommendations #2 and #3 state:

*"1. Install a new, curbed, watertight floor access hatch over the tunnel entrance at the Kessinger Gate House. A 4" to 6" high concrete curb with locking watertight hatch and/or a BILCO-type door is recommended. This is necessary to protect the raw water supply from potential spills from the oil tanks.*

*2. Remove fuel oil cans at the Kessinger Gate House or store within the oil tank containment curbing, and procedures must be in place to prevent overfilling the tanks. An alternative heating system should be investigated for this site."*

This incident and the exceptional response by all agencies illustrate not only the need to follow recommendations of the regulatory authority when recommendations are made, but also the need to utilize the expertise and knowledge of public health professionals at the local, regional and state level. Cooperative response and open lines of communication were critical in the management of this incident. Since much of this event was dynamic, with conditions changing often times by the minute, the response to this incident is of greater value than typical table-top exercises. It would benefit other water systems and health agency responders to be involved when incidents of this or similar nature occur.

In addition, the INFICON field analysis equipment utilized in this incident proved to be an amazing tool for decision-making in the ever-changing environment of this event. Though certified laboratory response was extraordinary, the availability and utility of the field equipment was invaluable. The New York State Department of Health and other emergency responding agencies (e.g. HAZMAT) should seriously consider the acquisition of these units for appropriate Public Health and Safety Response to time critical incidents (e.g. chemical releases, water contamination).

It is the hope of the OCHD, that this incident will be the necessary example so other public water systems will take the steps necessary to prevent similar or much more critical incidents from occurring (e.g. power outages, vandalism, major water main break). The OCHD will continue to assist the City of Rome water system and all other public water systems in Oneida County to both prevent emergencies and respond appropriately if an emergency situation occurs.

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## Recommendations and Requirements:

**The following recommendations and / or requirements are presented to prevent future events such as this:**

- ✗ Seal all weep holes in containment barriers to prevent future spills. **Must be completed immediately and no later than March 1, 2006. (Completed per discussion with operator)**
- ✗ System must provide adequate supervision of all day tank fill procedures. These must continue until the heating system is replaced and all fill lines removed. **Must be completed immediately and no later than March 1, 2006.**
- ✗ System must update the Emergency Response Plan to incorporate the response to this emergency and other similar events. **Must be completed no later than May 1, 2006.**
- ✗ System must contact the manufacturer of the in-line Particle Counter to determine if, in addition to recalibration and cleaning / repair of the unit itself (already scheduled), the tubing and flow cell need to be cleaned or replaced after contact with the fuel oil product. Tubing is typically not rated for fuel oil and it could be cause shedding in the tubing. **Must be completed no later than May 1, 2006.**
- ✗ Install new, curbed, watertight floor access hatches over each chamber access hole at the Kessinger Gate House, especially the tunnel entrance. A 4 to 6-inch high concrete curb with locking watertight hatch and/or a BILCO-type door is recommended. This is necessary to protect the raw water supply from potential spills. **Must be completed no later than June 1, 2006.**
- ✗ Replace the oil fueled heating systems with LPG fueled furnaces in all buildings that have direct access to water system via floor panels. No Oil heated furnaces should be allowed. **Must be completed no later than August 1, 2006.**
- ✗ As required in the Oneida County Sanitary Code by April 2004, appropriately sized Emergency Generators must be installed at all critical facilities to ensure continued operation when power outages occur. **Must be completed no later than August 1, 2006.**
- ✗ System must develop Standard Operating Procedures for all critical processes - including fuel refills, PAC slurry preparation, PAC applications, etc...
- ✗ System must maintain a number of sample bottles for emergency sampling. These sample bottles should include several bacteriological, POC, and DRO bottles and all necessary preservatives.
- ✗ System must maintain a supply of PAC at the Water Treatment Plant for emergency purposes.

- ✍ System must work closely with purchase systems to ensure that Water Conservation Orders are followed so that water consumption decreases following the issuance of an order. Only one system (Mohawk Correctional) noted reduced water use.
- ✍ System must consider ways to ensure Water Conservation Orders are complied with within the City of Rome water system.

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## Issues to Consider (Review of Response):

### The following issues were noted during the investigation of the incident that should be noted for future reference:

- ✍ Direct contact and interview of the person responsible for the spill could have been beneficial. He may have been able to tell us the specifics of what he saw and what fuel mix was used, and how the water was affected before the cleanup began. Only the Chief Operator interviewed this person before OCHD/NYSDOH arrival.
- ✍ If full disclosure as to fuel oil components *had been provided* (e.g. actual mix of 50:50 #2 fuel and kerosene, not just #2 Fuel Oil), samples would have been run for Primary Organic Chemicals (POC), these have a quick analysis time, the test is simple and relatively inexpensive, requiring much fewer laboratory resources. Diesel Range Organics (DROs) require 3 hours of prep work before the 45-minute analysis. DROs would have been run also, but turn around time on POCs would have helped to make quicker determinations regarding next steps in the process.
- ✍ Consider INFICON system for quick field analysis - not for legal issues, but for Public Health response and decision making capacity. 3-4 hour turn around on laboratory sample results may not be adequate. Several minutes is a much better situation, allowing for decisions based on current information.
- ✍ Sampling procedures should include at least 2 sets of bottles for each sample time/location (if possible). The broken bottle at one of the initial sample times could have been beneficial in determining exact peak concentrations and expected peak times of arrival at the WTP.
- ✍ Have bottles at sampling locations at all times regardless of schedule - to ensure ability to collect samples off-schedule.
- ✍ Always have extra bottles (and preservatives) on hand - annually replace from lab if necessary.
- ✍ Floating material (bobbers or crushed Styrofoam) at intake could show flow rate of transmission mains.
- ✍ Make contact with Troy office of NYSDOH early to involve them in decision making process. Wadsworth Lab should be activated ASAP to add additional support for response and assist in turnaround time.
- ✍ Direct lines of communication for appropriate personnel need to be established immediately - e.g. Lab is authorized by water system to release results to OCHD/NYSDOH via phone / fax.
- ✍ Documentation with dates, times, names, etc... is critical for follow-up and reporting.
- ✍ Have a good computer with either dial-up or cable Internet service and printer to setup in Headquarter at WTP in case WTP has poor system. In this situation, Internet and computer technology was limited.
- ✍ Cell phones with speaker capability are important.
- ✍ Plans for all components of system should be reviewed immediately upon arrival at site.
- ✍ Interview as many staff as possible - do not rely solely on a single operator's information. This is crucial to developing information and decision making.
- ✍ Early in the process, issue Conservation Notice and /or Public Notification to avoid last minute emergencies.
- ✍ If exact amounts are unknown and no method for measuring and documenting is available, assume larger amounts of product have entered the system.

✗ If ICS is used (should have been clearer), contact would have been to WTP, not OCHD offices. Site personnel from OCHD or NYSDOH would have been Health contact with Rome Plant Operator or DPW Commissioner as Incident Commander. Communications and staffing should be clear in future incidents to ensure adequate coverage and direct contact with people at site. Having "middle man" off-site was inefficient and did not help situation based on site knowledge of staff at WTP.

## Incident Contact Information:

Name	Agency	Address	Phone	Fax	Email
James Doyle	NYSDEC	Div. of Remediation - 207 Genesee Street, Utica, NY 13501	315-793-2554	315-793-2748	Jcdoyle@gw.dec.state.ny.us
Ron Heerkens, Associate Regional Director	NYSDOH - Syracuse	217 South Salina Street Syracuse, NY 13202	315-477-8484	315-477-8588	rhh01@health.state.ny.us
Jack Dunn, P.E., Acting Director	NYSDOH, BWSP	Room 400, Flanigan Square - 547 River Street Troy, NY 12180-2216	518-402-7650	518-402-7659	jmd02@health.state.ny.us
Rob Swider, P.E., Emergency Operation Chief	NYSDOH, BWSP	Room 400, Flanigan Square - 547 River Street Troy, NY 12180-2216	518-402-7650	518-402-7659	ras04@health.state.ny.us
Mike Horan, Chief Engineering Technician	NYSDOH, BWSP	Room 400, Flanigan Square - 547 River Street Troy, NY 12180-2216	518-402-7650	518-402-7659	mvh01@health.state.ny.us
John Strepelis, M.E., P.E., Regional Engineer / Field Coordinator	NYSDOH - Syracuse	217 South Salina Street Syracuse, NY 13202	315-477-8150	315-477-8581	jxs06@health.state.ny.us
Joseph Robertaccio, P.E., Public Health Engineer	Oneida County Health Department	800 Park Ave Utica, NY 13501	315-798-5064	315-798-6486	jrobertaccio@ocgov.net
Sean Clive, Senior Public Health Sanitarian	Oneida County Health Department	800 Park Ave Utica, NY 13501	315-798-5064	315-798-6486	sclive@ocgov.net
Eric Lemieux, Public Health Sanitarian	Oneida County Health Department	800 Park Ave Utica, NY 13501	315-798-5064	315-798-6486	elemieux@ocgov.net
Louis Ferrara, P.E., Public Health Engineer	Oneida County Health Department	800 Park Ave Utica, NY 13501	315-798-5064	315-798-6486	lferrara@ocgov.net
John Dunn, Interim Environmental Health Director	Oneida County Health Department	800 Park Ave Utica, NY 13501	315-798-5064	315-798-6486	jdunn@ocgov.net
Nicholas DeRosa, Interim Director of Health	Oneida County Health Department	800 Park Ave Utica, NY 13501	315-798-5064	315-798-6486	nderosa@ocgov.net
Antonio DiPaolo, Chief Operator	Rome WTP	6105 Stokes - Lee Center Road, Lee, NY 13363	315-339-7777	315-337-7808	tdipaolo@romecitygov.com
Frank Tallarino, P.E., Commissioner of DPW	City of Rome	198 N. Washington Street, City Hall, Rome, NY 13440	315-339-7635	315-339-7788	Ftallarino@romecitygov.com
Les Volles, R&D Chemist	INFICON	Two Technology Place East Syracuse, NY 13057	Tel: 315-434-1265	Fax: 315-434-2520	Les.Volles@inficon.com

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# Appendices

Title of Appendix	Included with this report?
A - Life Science Laboratory Sample Results Summary	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
B - INFICON Results Compared to LSL - Syracuse Results	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
C1 - Aerial Photographs & Maps of Rome Water System	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
C2 - Photographs from James Doyle, NYSDEC	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
C3 - File photos from Oneida County Health Department	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
C4 - Photographs from Rome City Website	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
D - Life Science Laboratory Sample Results (hard copies)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No