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FAX/MEMO

To: Hudson River File

From: John Szeligowski

Subject: Hudson River
Site Inspection
2/9/00 to 2/11/00

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Job No.: Hudson River

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PRELIMINARY

CONFIDENTIAL

This memo summarizes results of an Upper Hudson River site inspection performed by Brain Larsen/John Szeligowski (9 thru 11) and John Egan (10 and 11). The overall purpose of the inspection was to obtain information, including data, that would assist in the preparation of the Hudson River PCB Reassessment's Feasibility Study (FS). The particular focus of the site inspection was the part of the FS that will address removal of contaminated sediment.

It was planned to meet with NYSDEC, the Canal Corporation (Thruway Authority), Canadian Pacific RR, and possibly operators at the Port of Albany during the inspection. All these meetings occurred and considerable information was obtained as anticipated. In addition, NYSDEC and the Canadian Pacific representatives participated in portions of the field inspection program. Some thought was also given to meeting with Norlite Corporation (spelling?) to discuss their dredged material processing capability at Cohoes; this did not occur.

NYSDEC and Canal Corporation meeting at NYSDEC offices

Attending this meeting were Bill Ports (NYSDEC) and John Dergosits (Canal Corporation). An agenda was distributed the week prior to the meeting and was updated on 2/8/00. That agenda is attached and served to focus the discussion.

Item 1 - Identify locations where Upper Hudson sediments are exposed as a result of winter time water level lowering in the river/canal system.

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JD stated that because the dam at Lock 3 has been fitted with a system of adjustable panels or flashboards, it would be possible to lower the river between Lock 3 and Lock 4 and expose sediments in the vicinity of Hot Spot 37. The lowering would be about 4 feet and is limited to the elevation of the crest of Lock 3 dam. He mentioned that the flashboards were installed to enhance power generation at the adjacent hydro facility. Also, the flashboards are used to lower water levels when vessels requiring full canal clearance move beyond the railroad bridge at Stillwater Junction. This, apparently, was the principal river reach (Lock 3 to Lock 4) where JD thought that lowering water levels could expose contaminated sediments.

We then entered into a general conversation about the possibility of lowering water levels elsewhere in the system to enable excavation (instead of dredging) of contaminated sediments. BP thought that it might be worthwhile to look at the configuration of the Thompson Island impoundment. We did a quick calculation and determined that at 3,000 cfs. velocities in Lock 6 and its associated land cut could reach 5 fps. JD thought that this was too high for the Canal Corporation to consider such an option (by leaving the Lock 6 gates open). His concern was the impact of scouring in the vicinity of lock structures. BP then suggested that someone look at the TI dam to see if a bypass feature could be installed that would enable the TI Pool water level to be lowered.

I suggested that there was an unused power channel (part of a former hydro facility) at Lock 5 that could potentially be upgraded and operated so as to lower levels between Lock 5 and Lock 6. Since there is no currently operating hydro facility at Lock 5, concern over lost electrical output would not occur there. More importantly, however, several significant Hot Spots occur within this pool including No. 28. Thus, should water levels be lowered, there would be a potential to removal a substantial mass of PCBs by excavation methods. We agreed with BP to inspect this area during the next day's field trip.

At the conclusion of this part of the conversation, I suggested that in order to assess the potential benefits of lowering water levels, it would be necessary to review available bathymetric data and determine the extent to which shoreline areas would be exposed as water levels were dropped. TAMS has good bathymetry for the TI Pool and possibly down to Lock 5. Beyond that apparently neither the Canal Corporation, NYSDEC, nor TAMS have data to evaluate the benefits of lowering pool levels.

One final comment made by JD was that the Black Creek Water District controls a substantial portion of the Upper Hudson River flows. It may be possible to work with them to manage water levels during the removal work.

Item 2 - General discussion of dredging scenarios.

At this point I gave a brief summary of the Early Action Report and indicated that we were

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continuing to elaborate on the analysis contained in that document for purposes of the FS "removal" sections. Both BP and JD understood that the FS would evaluate a range of remedial options.

We briefly discussed mechanical versus hydraulic dredging. BP was skeptical that sediment resuspension could be as well controlled with a mechanical dredge as it could be with a hydraulic dredge. I mentioned to him that the problems created by using hydraulic equipment include:

- handling large water volumes;
- pumping dredged material substantial distances to shoreside processing facilities;
- locating several relatively large areas for processing of sediment slurries prior to shipping stabilized material to ultimate disposal sites.

BP understood the points I raised concerning hydraulic dredging. He also expressed interest in obtaining additional information concerning several of the newer mechanical systems that generate less suspended material than earlier equipment. Should we propose mechanical removal methods he stressed that we also consider use of supplementary containment methods around the work site. These could include silt curtains, porta-dams, sheet piling, and others. BP expressed some interest in seeing a comparison of mechanical and hydraulic systems performed as part of our analysis. He also indicated that we should be aware of the presence of potable water intakes along the Upper Hudson (Waterford and Schuylerville).

Item 3 - Availability of clean dredged material to backfill dredged or excavated areas.

JD stated he was aware of two potential sources of silty materials that could be used to restore river bottom conditions after contaminated sediments had been removed. One of these sources was located a short distance up the Mohawk River at Vischer Ferry. This material is stored in an upland stockpile and could be available for backfilling. A second source was the dredged material that is removed from the Canal north of Lock 8. The Canal's summit lies between Locks 8 and 9 and thus material removed from north of Lock 8 is considered to be relatively free of contamination. However, as far as JD knew, there were no existing stockpiles of dredged material in this area.

Items 4, 5, 6, 7, 8, and 9 - Canal clearances, recent maintenance dredging, recent soundings, traffic limitations, night time operations, commercial traffic characteristics

Canal clearances are referenced to "normal pool elevations". JD provided a chart of such elevations for the Champlain Canal from Lock 1 to Lock 8. While TAMS probably has some of the following information in its files, it is useful to summarize the principal clearance limits, as discussed at the meeting, here. Normal pool elevations are as follows:

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Locks 8 to 9 - 140.1 feet mean seal level
Locks 7 to 8 - 129.1 msl
Locks 6 to 7 - 119.1 msl
Locks 5 to 6 - 102.6 msl
Locks 4 to 5 - 83.6 msl
Locks 3 to 4 - 67.6 msl
Locks 2 to 3 - 48.1 msl
Locks 1 to 2 - 29.6 msl
below Lock 1 - 15.3 msl

In relationship to normal pool elevations, the Canal provides a 15.5 foot headroom clearance with the current exception of the railroad bridge above Lock 3. In order to obtain the full clearance at the bridge it is necessary to lower pool elevation by raising some of the flashboards at Lock 3 dam. The nominal available channel water depth is 12 feet in relationship to normal pool elevation. The limitation on the width of vessels that can navigate the Canal, controlled by the dimensions of Lock structures, is 43.5 feet. Furthermore the length of vessels that can move through the Canal is limited to 300 feet.

Transit time down the canal can be estimated by using the posted speed limit on the system of 10 mph. In addition, transit time through a lock is about 20 minutes. As of this time (1999 season) there is not enough traffic on the system to cause queuing at the locks. A possible exception occurs each season immediately after the Canal opens and just prior to its seasonal closing. The Canal is open from approximately the first Monday in May to the Friday before Thanksgiving. For commercial traffic it is possible to operate the system 24 hours per day (commercial users pay a lockage fee of $750/year/vessel). JD stated that should weather permit, it may be possible to keep the Canal open beyond its normal season for remediation purposes. As of this time there is essentially no commercial traffic on the Canal.

JD indicated that each year the Canal Corporation conducts a series of sweeps of the system to determine where sediments have accumulated and are limiting vessel clearances. The sweeps are conducted using manual methods (depths are estimated by extending rods to the canal bottom) and results are recorded as feet of material accumulated above nominal bottom elevation. The 1998 sweeps are available upon request while the 1999 sweeps are still being quality checked. Based on results of the sweeps, the Corporation issues information on draft limitations in an official "notice to mariners".

JD mentioned that essentially no dredging has occurred in the Lock 1 to Lock 7 reach since 1979. The exception is in the area where the Hoosic River discharges into the Hudson between Locks 3 and 4. This reach was dredged as recently as two years ago. The material that enters the Hudson via the Hoosic consists of coarse sands and gravels. Upon analysis for PCBs this material was found not to be contaminated and, therefore, could be dredged and disposed.

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Item 10 - Additional information that can be provided by the Canal Corporation.

The Canal Corporation has considerable additional information about the Canal system that may be of value as work on the FS proceeds. JD did not have this information with him but indicated that we could obtain the material by submitting a written request to him. The following is some of the information that we should consider requesting.

Canal sweeps - These are the large data sheets that contain yearly information on sediment accumulation in the canal. We should probably request the 1998 data and also request the 1999 information when it is released.

PCB data - Apparently, from time to time, the Canal Corporation obtains sediment samples and tests them for PCB levels. While the sampling and analytical protocols they use are not as detailed as those TAMS used during the course of the Reassessment, the Corporation's data may be of general value.

Property Holdings - During the meeting JD mentioned that the Corporation has considerable property holdings along the Upper Hudson. Included in these is a parcel in the vicinity of Lock 5 where there is an existing bulkhead wall at the site of a former hydro facility. This location is of some interest to us for the following reasons:

- because of the bulkhead, this site has some potential to be used as a sediment transfer facility;
- a former rail line dead ends here;
- the abandoned power canal can potentially be used to lower pool levels between Locks 5 and 6.

Thus we should consider requesting, from the Corporation, a site plan and property map for this location. While JD identified additional holdings that may be of interest to us, it is my view, based on the next day's site inspection, that none of the other holdings discussed by JD are of immediate interest to us.

Navigational data - During the discussion JD referred to the 'notice to mariners" that identifies navigational hazards resulting from, among other factors, sediment accumulations. In addition, he mentioned that the Corporation issues an annual report on Canal traffic volumes. Finally he also mentioned that there was information available on Canal travel times.

Boring Logs - The Corporation has borings in the vicinity of various Canal structures. If we have need of a limited number of these (at Hot Spot 28 for instance), we can request them. JD also mentioned that the original Canal drawings have been reproduced on micro-film and are available for viewing, at their offices.

River Inspection with Bill Ports of NYSDEC

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On Thursday Bill Ports led an inspection of River shoreline areas that potentially had some applicability to the project's sediment removal scenarios. Participating were John Egan, Brian Larsen, and John Szeligowski. We basically worked our way from south to north and ended the inspection at the Moreau site.

Lock 1 - We stopped here because the previous day JD mentioned that the Corporation had considerable property holdings that might be relevant to the project. Upon inspection, that did not appear to be the case. Residences here are situated between the river and Route 4 and there did not appear to be suitable industrial type land for a transfer operation. JD also mentioned that Kivort Steel was planning to run a rail spur down to the River somewhere in this reach. It was not obvious where the spur might be situated.

Lock 2 - Again we went to this location because of the availability of Corporation land holdings. However, given the large wetland (Hot Spot 39) on the north side of the Lock and the hydro facility and substation on the south side, it was concluded that a transfer operation could not easily be sited here. There was some question, however, as to whether the power complex was actually functioning.

Lock 3 - This site was inspected for several reasons. The dam here supports a series of flashboards that regulate the upstream pool elevation and can thereby create a clearance problem where the river flows under an active railroad bridge. It was also thought that there may be some property in this area that could be used for transfer operations. This proved not to be the case.

However, immediately upstream on the left bank there is a large piece of land that has good potential to serve as a sediment transfer point. The site is undeveloped and is bounded on the north by an active two track rail line operated by the Guilford System. We were able to inspect most of the site by walking up onto the rail embankment. The two track rail line is about 10 to 20 feet above local grade where we walked onto the embankment. The track and bed appeared in excellent condition. However, given the difference in elevation between the track and local grade, there may be difficulty in running a spur onto the property where transfer operations would occur.

BP offered to identify the property owners if we requested him to do so. Also, we have not contacted the Guildford System for any information about their operations at this point or what their interest would be in setting up a rail spur here for a sediment intermodal operation. If this site were to be used, the Guilford System would probably only provide a short haul to the nearest connection with either CSX or the CPRR. Since the yard at Mechanicville has essentially been eliminated, there is no obvious nearby area to store rail cars while a full train is made-up. Again, it would be necessary to talk to Guilford for more information in this regard.

Lock 5 - The next site inspected above Lock 3 was the Lock 5 area. There is only one Hot Spot

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in the relatively lengthy reach between Lock 4 and 5 and no sites with potential rail access occur in the Lock 4 to 5 reach. However, in the Lock 5 vicinity, at the Northumberland Dam, can be found an abandoned hydro facility and the site of a former materials handling operation (left bank). According to the Canal Corporation (JD), this property belongs to the Corporation and was leased to a firm that barged construction supplies up the Hudson. Based on a previous site inspection conducted in November 1999 (see memo Szeligowski to Bruce Fidler dated 11/8/99) it was thought that this area had only limited potential to serve as a sediment transfer site. However, given the conversation at NYSDEC offices the previous day, the site was re-inspected and a number of concepts evolved for removing and handling contaminated sediments within the Northumberland-Fort Miller Pool.

The Northumberland-Fort Miller pool (Lock 5 to Lock 6) contains a substantial fraction of the Upper Hudson PCBs including Hot Spot No. 28. Thus, devising a solution tailored to the removal of contaminated sediments in this reach could resolve an important part of the Upper Hudson problem. The length of this pool is about 3.5 river miles and development (residential or industrial) along the shoreline is relatively light (we did not specifically observe riverfront landuse during this inspection). Based on conversations at NYSDEC offices and observations made during this inspection, several conceptual approaches were formulated for removal of pool sediments:

- if a sediment transfer/processing facility is constructed within the TI pool reach (say at Moreau), the Lock 5 to 6 sediments could be mechanically dredged and barged to that transfer facility;
- if a transfer operation were set up in the Port of Albany, the sediments could be mechanically dredged and barged to Albany;
- if the defunct railroad at the Northumberland Dam (left bank) were rebuilt, it may be possible to dredge sediments within this reach, process them at the Dam, and ship them out by rail (this does not appear to be very likely based on the condition of the rail line and the limited area available for rail car storage);
- if a stabilization facility were constructed above the Northumberland Dam it would be possible to mechanically dredge the sediments in this pool, bring them to that facility for processing, and haul them to Albany in a hopper barge as a bulk (soil) commodity (no land needed for rail facilities);
- since the pool is about 3.5 miles long, it would be possible to construct a sediment processing facility at approximately the pool's mid-point and pump hydraulically dredged sediments to that facility for dewatering and then shipment by barge to Albany as a bulk commodity;
- if the channel that brought water to the now defunct Northumberland hydro facility were re-built, it could be possible to lower pool water levels and thereby perform removal work in relatively dry conditions; methods of transporting dredged sediment need to be established for this alternative.

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Moreau Landfill Locale - Considerable time was spent with BP at this location. It appears that NYSDEC is very comfortable with the possibility of setting up a transfer facility at this location. This partly stems from the fact that they would like to see the several dredged material landfills at this location excavated and the contaminated material (soil) hauled to a more suitable landfill away from the Hudson Valley. It is not completely illogical to think that if transfer operations were set up here for river sediments, the same transportation facilities (rail) could be used for the landfill materials.

As we walked the site (about a foot of snow covered the area) there was some conversation concerning operations at the paper recycling facility (Encore Paper) that is located at the locale's north end. BP thought there had been a recent fire here and that some of the rubble piles represented debris from that incident (an odor of charred material was present). We walked off the upper terrace of Old Moreau landfill and proceeded to the river's edge. It appeared that even on this lower terrace there was an approximate 15 to 20 foot drop to river level. This change in elevation complicates situating a transfer facility in this location.

I mentioned to BP that during my previous site inspection (11/99), I was able to drive onto the marina immediately south of the area where we stood. At that point the shoreline is only a few feet above river level (explains the marina being there). Since the marina is possibly several thousand feet south of where we stood, using that location for transfer operations would avoid the significant elevation change near Moreau and would also reduce the quantity of dredging needed to set up a waterfront work area (the navigation channel is south of Moreau and favors the east side).

After returning to BP's car we drove toward the marina and noted that that property was being advertised for sale. BP speculated that the marina could be purchased, used for transfer operations, and then restored and used again as a marina or as parkland along with the rest of Moreau. If the marina were available, the marine transfer station and sediment stabilization facility could be established there and processed sediments could then either be hauled to the rail siding at Moreau or the rail siding could be extended toward the marina site.

BP offered to establish ownership of the properties in the Moreau area if requested to do so. I will proceed to ask him to do so, at least by phone call. In fact, he volunteered to provide as much assistance as necessary to move the FS to completion and indicated he wanted to participate in the program. Several times during the inspection BP mentioned he was pleased that TAMS was proceeding as indicated during this inspection, and that he was impressed with our attention to matters he considered important.

After inspecting the Moreau area, we proceeded to Rogers Island. One reason for going there is detailed in my memo describing the 11/99 field inspection. I retrospect, it is not clear whether or

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not PB thought that establishing a transfer facility here would be viable. A second reason for visiting the Island was to observe some shoreline remedial work occurring on the north end. Apparently, some contaminated sediments were being excavated along the immediate shoreline area.

Operations at the Port of Albany

After being dropped-off by BP, three of us (JE, BL, and JS) proceeded to the Port of Albany to confirm findings of the 11/999 inspection and possibly obtain additional information concerning establishing a transfer operation there. During my previous discussions with the Canadian Pacific Railroad (CPRR - see the memo dated 1/14/00) they mentioned that a marine terminal operation (focused on handling construction materials) was being established a short distance beyond the Port's south gate. The CPRR was evaluating extending rail service to that marine terminal.

We proceeded to drive the length of the Port District (north to south) and confirmed that there would be potential sites for a transfer facility within the Port boundaries and that good rail service was obviously available (both CSX and CPRR). The important point is that the entire area is highly industrial in character and that bulkhead walls extend the entire length of the District's waterfront.

Another important feature here is the large number of truck movements entering and leaving the Port each day due to the availability of excellent interstate highway connections. It is possible to conceive of trucks hauling stabilized dredged material from the Port to a final disposal site under certain conditions (for instance, if the disposal site were situated so that a truck could make multiple trips or, at a minimum, at least one complete round trip per working day, the economics of trucking could be favorable).

Just south of the Port we met (somewhat unplanned) representatives of the marine terminal operation that the CPRR had mentioned in January. This firm (Port Terminal Limited and Empire Harbor Marine - EHM) has historically operated barges on the Upper Hudson and had been active in handling construction materials at Lock 5. They also do dredging work and have recently completed a PCB project in Long Island Sound. We briefly inspected the machine they used on the Sound which is a modified excavator (Komatsu P400) with a swivel bucket that is hydraulically actuated. Apparently, EHM designed this bucket themselves so as to reduce resuspension of contaminated sediments.

Needless to say they were interested in our inquiries and provided some useful insight on the difficulties of moving commercial traffic up river. They were somewhat more negative than JD concerning available clearances (particularly draft limitations) on the Upper Hudson. Historically, they have used two types of barges to move materials up river: hopper type and deck

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type. Normally the deck barge handles equipment and the hopper handles bulk materials though they indicated that by fitting a railing onto the barge they have routinely handled bulk materials with deck type equipment.

As might be expected, EHM recommended that we consider moving dredged material down river in as large a load as possible to improve project economics. For this purpose they recommended using hopper barges and loading them with about 1000 tons of dredged material. Their equipment (barge and tug) has historically been sized to meet the clearance limitations of the canal (length and width) though it appears that very little such equipment is now available (inferred from the conversation) since there is little or no commercial traffic on the Upper Hudson. Draft requirements for a typical canal compatible hopper barge are as follows:

2600 short ton load - 13 feet
1800 short ton load - 10 feet
1200 short ton load - 8 feet
900 short ton load - 7 feet
400 short ton load - 5 feet
200 short ton load - 4 feet

EHM indicated that they would answer any additional questions we might have if we gave them a call. The questions we most likely will have relate to costs for moving sediments down river by tug assisted barge.

Site Inspection with Canadian Pacific RR

On Friday we met with representatives of the CPRR in their Clifton Park office. After the meeting the TAMS team and representatives of the railroad inspected the Moreau site as well as the Fort Edward Yard. The meeting began with a brief overview of the situation. Not surprisingly the railroad exhibited considerable interest in the project since the CPRR operates the major rail line in the project area. The focus of the discussion was the viability of establishing a rail transfer facility at Moreau and using the Fort Edward Yard for rail car storage.

The CPRR indicated they will provide us with rail rates to use in our cost analysis as soon as we can better define the shipping scenario (number of cars per day, type of car, method of loading, etc.). They suggested we consider using hopper cars and ship the stabilized sediments in bulk form as a means of reducing overall project costs. This approach may be more relevant for shipments to the Wayne, MI disposal site than to the Model City site where there is no current rail access. However, the suggestion that we consider shipping stabilized sediments in bulk form should be given further consideration.

The CPRR representatives confirmed the viability of using Fort Edward Yard to store loaded rail

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cars. Basically, as stated in my earlier memo, the Moreau transfer site may only need enough track length to store rail cars holding one day's output of stabilized sediments. Due to the proximity of the Yard, the CPRR would pick up loaded cars at Moreau each day and drop off empties at the same time. This reason this scenario works for the railroad is the proximity of Fort Edward Yard to Moreau.

After the meeting we proceeded to inspect the Moreau site. Our inspection took us along the single track main line out to the rail bridge leading to Rogers Island. The CPRR pointed out that the switch off the main line is in-place at Moreau which would be a savings to the project ($80,000 to install a mainline switch). In addition, we noted two sidings leading to the Encore property. The sidings were in poor condition (one may actually have been removed) but it is expected that they can be repaired and put back into operation ($100 per foot to install ballast, ties, and rail).

The Encore site did not appear to be very active though some work was obviously still occurring there. Since Encore does not appear to be using their sidings at this time, it may be possible to work out an arrangement with them as part of the overall program to establish a transfer facility at Moreau. If that were to happen, the need for new trackage at Moreau would most likely be limited to one additional siding. The overall scenario for Moreau would then be (1) sediments would be off-loaded at the river, (2) the dredged material would be stabilized near the waterfront area, and (3) the stabilized material would be hauled up the hill to one of the rail sidings for loading onto rail cars. A number of variations to this scenario are also possible depending on the land available for the transfer facility, how the dredging is actually accomplished, the method selected for shipping sediments, etc.

After the Moreau inspection we reviewed conditions at the Fort Edward Yard. The Yard is not well situated in terms of truck access. While there are a considerable number of truck movements, associated with the local wood products industries, going in and out of the Yard, it is not likely that the local community would accept trucks hauling contaminated sediments (from Moreau) moving through a residential district.

However, conditions looked favorable for storing loaded rail cars at the Yard. The Yard appeared to have seven tracks that could store about 20 to 30 cars each (to be confirmed). At the time we were there the Yard trackage looked well-utilized and appeared to be handling 70 or 80 rail cars including several bulk liquid tankers. The CPRR is licensed to carry hazardous materials and, therefore, will be able to manage the movement of PCB contaminated sediments. Given the activity at the Yard there is some possibility that another siding would need to be constructed to accommodate materials coming from a Moreau transfer facility.

One important aspect of the Fort Edward Yard is that the yard area does not abut residential land uses. While the principal vehicular approach to the Yard is via a residential community, the

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Yard itself is well removed from those residences. Rail cars being moved to the Yard from Moreau will proceed through an at-grade crossing before entering the Yard.