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

Signed August 18, 2004

MEMORANDUM

SUBJECT: CSTAG Recommendations on the Centredale Manor Restoration Project (CMRP) Superfund Site

FROM: Stephen J. Ells /s/ **Stephen J. Ells**
John Meyer, Co-chairs /s/ **John Meyer**
Contaminated Sediments Technical Advisory Group (CSTAG)

TO: Anna Krasko, Remedial Project Manager
Region 1

Background

OSWER Directive 9285.6-08, *Principles for Managing Contaminated Sediment Risks at Hazardous Waste Sites* (February 12, 2002), established the Contaminated Sediments Technical Advisory Group (CSTAG) as a technical advisory group to "monitor the progress of and provide advice regarding a small number of large, complex, or controversial contaminated sediment Superfund sites." The main purpose of the CSTAG is to help Regional site project managers appropriately manage their sites throughout the Superfund process in accordance with the eleven risk management principles set forth in the OSWER Directive. CSTAG membership consists of one representative per Region, two from the Office of Research and Development, and two from the Office of Superfund Remediation and Technology Innovation.

Brief Description of the Site

The Centredale Manor Restoration Project (CMRP) Superfund site is in North Providence, RI. The main part of the site, referred to as the source area, is located at 2072 and 2074 Smith Street (Route 44) and encompasses approximately 9 acres. The remaining portions of the site consist of free-flowing reaches and surface water impoundments of the Woonasquatucket River. The CMRP site study area currently includes the 3-mile reach of the Woonasquatucket River from the Route 44 bridge immediately upstream of the Brook Village apartment complex, downstream to the former Dyerville Dam. This reach of the river has four existing or former dammed impoundments; from north to south they are: Allendale Pond, Lyman Mill Pond, Manton Pond, and Dyerville Pond (only pilings remain of the former Dyerville Dam). The land uses surrounding the site are mixed residential, commercial and industrial. Future land use in the area is not expected to change significantly. The Woonasquatucket River is not used as a source of drinking water, but sections of the river and adjacent floodplains are used for recreation, including fishing.

Dioxin was first identified in the study area in 1996 in fish collected from the Woonasquatucket River by the EPA as part of a water quality investigation. Since that time, elevated levels of contaminants including dioxin [primarily 2,3,7,8-tetrachlorodibenzo-p-dioxin

(TCDD)], polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and metals have been detected in biota, soil, sediment, surface water, and groundwater at the site. An analysis of historical aerial photographs revealed evidence of waste disposal at the source area of the site, including the presence of drums, stained soils, grading scars, evidence of solid and liquid waste materials, and small surface water impoundments. The photographs show evidence of drainage leading west from waste disposal areas into the Woonasquatucket River, and east towards a tailrace (drainage channel) along the eastern boundary of the source area of the site.

From the 1970s to mid-1980s, the Rhode Island Department of Environmental Management (RIDEM) inspected the source area of the site. Hundreds of drums were observed, some of which were visibly smoking. RIDEM directed disposal of approximately 400 drums and 6,000 cubic yards of contaminated soil, which were removed from the site. Chemicals that were potentially used on site included caustics, halogenated solvents, PCBs, and inks. Evidence from historical photographs, state report files, and geophysical testing suggests that buried waste material are still present in several areas of the site. The site was added to the National Priorities List in February 2000. Since 1999, EPA Superfund activities at the source area of the site included construction of three interim soil caps and fencing of the contaminated areas.

A 'catch and release only' fish consumption advisory was issued by the State of Rhode Island Department of Health and EPA in 1999 for dioxin and mercury. This advisory was updated in 2003. The reach of the river that includes the site is listed as an impaired water body under Section 303(d) of the Clean Water Act. Impairment has been attributed to pathogens, metals (cadmium, lead, copper, and mercury), PCBs, dioxins, excess algal growth, and low dissolved oxygen.

Contamination at the CMRP site is being addressed in two stages: immediate and short-term removal actions, and long-term remedial actions. A time-critical removal action (TCRA) was conducted at the site in 1999 and 2000 to reduce the immediate human health threat to residents on and near the site. The interim caps were designed to minimize human exposure to contaminated soils and waste and to prevent soil erosion and runoff into the river and Allendale Pond. Another TCRA was performed in 2003-2004 to minimize potential erosion and downstream transport of contaminated soils and sediments in the former tailrace on the east side of the source area. In 2001, a non time-critical removal action was conducted for the dam replacement and for soil removal at residential properties.

Several studies were conducted between 1997 and 2004 to characterize the nature and extent of contamination in sediment and surface water at the site, as well as soil and groundwater in the source area. Some data were collected before the 2001 breach of the Allendale Dam and some were collected after. Although dioxin is the primary contaminant of concern; other contaminants, including PCBs, metals and PAHs, also appear to be contributing to the unacceptable risk and are being evaluated as part of the RI/FS.

The CSTAG visited the site and met with the site team on July 14 and 15, 2004. Five of the invited stakeholder groups associated with the Superfund site participated in the meeting and made presentations to the CSTAG. They were: 1) the Mayor of North Providence; 2) the Woonasquatucket River Watershed Council; 3) the Centredale Participating Respondents Group; 4) the Centredale Manor Site Group, including the New England Container Corp. customer group and CNA Holdings, Inc.; and 5) the Urban River Team. Written comments were provided by the Rhode Island Department of Environmental Management and the National Oceanic and Atmospheric Administration.

CSTAG Recommendations

Based upon our site visit, a review of the site information provided to us, and the presentations made by stakeholders, the CSTAG offers the following recommendations in order to more fully address the 11 principles. The CSTAG expects that the site project manager will consider these recommendations as the investigations continue, as the conceptual site model is refined, and as remedial alternatives are developed and evaluated. The EPA RPM should send a short written response to these recommendations to the CSTAG co-chairs within 60 days.

Principle #1, Control Sources Early

- Continue to assess other key potential contaminant transport pathways to the ponds and river (*e.g.*, possible underground storage tanks at Greystone Mill Pond, non-point sources, Smithfield wastewater treatment plant; storm water outfalls) in order to evaluate if they contribute significantly to sediment contamination and thus could affect the performance of future response actions.
- Analyze the dioxin concentration in the total suspended solids and in the dissolved water column to evaluate downstream dioxin transport. This information could be used to generate a mass balance for dioxin within and beyond the site. Represent this information in a conceptual site model diagram that shows inputs and exports of dioxin from the study area, fate and transport mechanisms, and exposure pathways to identify data gaps for the mass balance.
- Assess whether the groundwater monitoring network is sufficient to evaluate sources of contamination to the river from buried wastes. This includes whether NAPLs or groundwater contaminants may be facilitating dioxin transport to the Woonasquatucket River that may require modifications to the interim caps (*i.e.*, Brook Village parking lot). Consider using mini-piezometers or another method to evaluate contaminant discharges directly to the river via groundwater.
- Since contamination has been found in the forested wetland below the Allendale dam, evaluate the extent to which this area is or may become a potential source (*i.e.*, secondary source) of contamination to the river through erosion.
- If possible, continue working to identify the source of the thick, loosely consolidated, black material that smells of poly aromatic hydrocarbons at the top of the sediment cores retrieved from Lyman Mill Pond. It is important to determine if there is an on-going source of this material (e.g., the upstream waste water treatment plant) or if it is due to urban run-off.
- Consider the extent to which ongoing sources are contributing contaminants other than dioxin, that may lead to unacceptable residual risks upon the completion of any future response action at this site.

Principle #2, Involve the Community Early and Often

- Due to frequent flooding in the area, the CSTAG recommends sampling of the residential properties adjacent to the Woonasquatucket River and Allendale Pond that were remediated in order to determine if they have been re-contaminated from flooding that occurred after the removal actions.
- The CSTAG commends the project team for its outreach efforts thus far and encourages the continuation of these activities.
- Evaluate whether placement of additional fish/eel consumption advisory signs could increase their effectiveness in discouraging consumption throughout the study area.
- Repair gate locks and consider whether signs are necessary on the fences surrounding the caps to further discourage access.

- Coordinate with other river revitalization initiatives such as the urban river revitalization pilot project and the Woonasquetucket River Watershed Council when developing and evaluating cleanup alternatives for the site. In communicating potential remedies to the community, discuss how cleanup alternatives can address community concerns about aesthetic qualities and can be integrated with planned future uses of the site.
- Consider whether additional coordination with downstream communities (*i.e.*, Providence) is necessary, especially since the down gradient extent of contamination is not known.

<u>Principle #3, Coordinate with States, Local Governments, Tribes, and Natural Resource Trustees</u>

- Develop a complete list of owners of the existing three dams in the study area and coordinate an assessment of the structural integrity (e.g. both upstream and downstream of the dam face) of the existing dams, and an understanding of the current operational and maintenance programs (e.g. sediment sluicing/flushing). The major findings and conclusions of this evaluation should be integrated into the Institutional Controls component of the final remedy.
- The CSTAG commends the project team for its coordination with local government.
- Coordinate with ATSDR on the timing of their health assessment and any recommendations that they may make so that issues raised by ATSDR can be considered in future remedy selections.
- Coordinate with RIDEM on the TMDL development for the River so that information useful to both the site investigation and the TMDL development can be shared and so that the TMDL can be adequately considered when selecting a remedy.

<u>Principle #4, Develop and Refine a Conceptual Site Model that Considers Sediment Stability</u>

- Evaluate the spatial variation in the grain size distribution and organic content in the surface sediments (*i.e*, top three inches) within the chosen modeling domain to help guide location of the sediment stability studies and sediment samples.
- Evaluate the stability of the bed sediments in the River using the USACE's Sedflume or some other equivalent device.
- Develop a pictorial CSM that shows inputs and exports of dioxin from the study area, fate and transport mechanisms, and exposure pathways. Use this CSM to refine the goals of this study and to identify data gaps to guide additional data collection activities.
- Include the fate of dams in the CSM and in the modeling component of the sediment stability analysis (*i.e.*, evaluate maintenance and dam failure scenarios separately).
- Ensure that the downstream extent of the sediment contamination is adequately characterized. This will allow accurate evaluation of the extent and cost of alternatives and in predicting residual fish tissue concentrations after cleanup.
- Consider developing a curvilinear-orthogonal grid to better represent the hydrodynamics in the Woonasquatucket River upstream of Allendale Pond and between the two ponds.
- The stated objectives of Phase 1 of the sediment stability study are to evaluate the impact of floods of various magnitudes (*i.e.*, up to a 100-year flood) on surficial dioxin TEQ concentrations in Allendale and Lyman Mill Ponds, and the effect different remedial alternatives will have on mitigating the impacts of a rare (*i.e.*, 100-year) flood. To accomplish these objectives, expand the computational grid for the hydrodynamic model to represent the 100-year floodplain. Not doing so will result in higher predicted velocities and smaller residence times in the impoundments, the result of which will be highly conservative estimates of scour depths and expand the areas where scour would be predicted to occur within the ponds.
- Characterize the dioxin concentration, composition, and the areal extent of the sludge/muck in Lyman Mill Pond. Consider the presence of the thick muck (*i.e.*,

gelatinous) layer in both ponds (though more abundant and thicker in Lyman Mill Pond), that was not captured by the bathymetric surveys, in the model since it will affect the hydrodynamic drag. The muck layer that is very high in organic matter should also be considered in estimating the scour depths.
- Use Acoustic Doppler Current Profilers, or some other appropriate instrument, to measure the velocities needed to calibrate the hydrodynamic model.

Principle #5, Use an Iterative Approach in a Risk-Based Framework

- Consider the timing of cleanup actions and sampling when coordinating with community plans to develop fish passage ways/ladders. Fish passage further up river should not be encouraged until source controls are complete and bioaccumulation pathways are mitigated.

Principle #6, Carefully Evaluate the Assumptions and Uncertainties Associated with Site Characterization Data and Site Models

- We expect that the use of a BSAF or some other bioaccumulation model will be critical in developing the sediment cleanup level and in predicting the post-remedial residual risks from various alternatives. Since the sediment samples were collected before the dam breach and most of the fish tissues samples were collected after the breach, the dioxin levels in the fish may not bear a meaningful relationship to the previously collected sediment data. The CSTAG strongly recommends that new, co-located sediment and fish tissues samples be collected to develop a BSAF.
- Revise the presentation of the ecological risk assessment results to ensure more clarity and transparency, and place more emphasis on site-specific empirical data than on literature values.
- Modify the human health risk assessment to also present risks from total PCBs instead of just Aroclor-1254.
- Consider whether consumption of turtles should be evaluated in the human health risk assessment given the high lipid content of the organisms and the fact that people have been observed removing them from the river and presumably eaten.

Principle #7, Select Site-specific, Project-specific, and Sediment-specific Risk Management Approaches that will Achieve Risk-based Goals

- Evaluate alternatives within the FS that include dam reconstruction and/or on-going maintenance for leaking, and others that include dam removal.
- If the remedy incorporates the existing interim caps, consider what additional work may be needed to ensure that they are effective over the long-term (*i.e.*, monitor the caps to ensure that the waste is not migrating). If additional work is required at the areas with the interim caps, the extent and effects of that work should be considered when evaluating remedial approaches for the rest of the site.
- The stated reason for rebuilding the Allendale dam was to "...prevent further downstream migration of sediment-bound contaminants...." As part of the RI/FS, evaluate whether this goal was achieved, and if the replacement of the Allendale dam was effective in minimizing contaminant transport.
- Consider the background concentrations found at Greystone Mill Pond, instead of the reference location, when developing the sediment cleanup levels.
- Consider evaluating an alternative that minimizes off-site sediment disposal by consolidating and capping contaminated sediments on-site.
- Develop volume estimates for contaminated sediments based on a range of preliminary cleanup goals.

- Consider the use of surface area weighted average concentrations when setting cleanup levels.
- Ensure that the indirect effects of remedial alternatives (*e.g.*, changing water depths via cap placement, the weight bearing capacity of the sediment bed, sediment resuspension, downstream transport, bed shear stress, *etc.*) are carefully evaluated within the FS.

Principle #8, Ensure that Sediment Cleanup Levels are Clearly Tied to Risk Management Goals

- Thoroughly evaluate any proposed RAOs for fish tissue and sediment concentrations to ensure they are achievable.
- Considering the wide range of site uses (*e.g.*, recreational, industrial, residential) carefully consider the wide range of views of future use when developing RAOs.

Principle #9, Maximize the Effectiveness of Institutional Controls and Recognize their Limitations

- Collect site-specific information to document the effectiveness of any institutional controls required as part of the selected remedy (*i.e.*, fishing advisories).
- Where institutional controls are not already in-place to maintain dams, consider the appropriateness of establishing ICs to ensure that sediment does not migrate and/or cause unacceptable risks in the event of dam failure, or to ensure it is managed appropriately in the case of dam removal, sluicing, or maintenance.
- If an alternative is proposed that assumes one or more of the dams will stay in place, develop mechanisms to ensure dams are maintained, and consider developing a contingency remedy that would address the fate and transport of the impounded sediments if one or more of the dams are removed.
- Ensure that access to the contaminated areas is limited by securing gates and posting appropriate signs.

Principle #10, Design Remedies to Minimize Short-term Risks while Achieving Long-term Protection - The CSTAG will evaluate consistency with this principle later in the process.

Principle #11, Monitor During and After Sediment Remediation to Assess and Document Remedy Effectiveness - The CSTAG will evaluate consistency with this principle later in the process.

Regional Response

Please send us a short written response to these recommendations within 60 days. If you have any questions or would like a clarification to any of these recommendations please call one of us (Steve Ells at 703.603.8822 or John Meyer at 214.665.6742).

cc: Susan Studlien, Region 1
Larry Brill, Region 1
Mike Jasinski, Region 1
JoAnn Griffith, OSRTI
Rafael Gonzalez, OSRTI
Michael Cook, OSRTI
Betsy Southerland, OSRTI