Updated Tar Removal Work Plan
Cabot Carbon/Koppers Superfund Site
Gainesville, Florida

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1 Introduction

A number of investigations have been undertaken to evaluate sediment quality in Springstead and Hogtown Creeks in the last approximately 30 years. In 2008, a comprehensive field reconnaissance survey and follow-up, focused sediment chemical characterization program was undertaken by the Alachua County Environmental Protection Department (ACEPD) to further characterize sediment quality in the creeks (ACEPD, 2009). Springstead and Hogtown Creeks are urbanized creeks located downstream of the Cabot Carbon/Koppers Superfund Site in Gainesville, Florida ("Site"; Figure 1). Although operations at the Cabot Carbon facility ceased in 1966, historical inputs, including storm and waste water discharges and a breach of former pine products lagoon by a developer, may have contributed Cabot-related contamination to Springstead and Hogtown Creeks. The Koppers wood treating facility is also believed to have discharged storm water from 1916 onwards to these creeks.

The field reconnaissance portion of the 2008 ACEPD sediment investigation was extremely thorough and included advancement of sediment probes at hundreds of locations in Springstead and Hogtown Creeks. The field reconnaissance identified the presence of tar-like material, typically at a depth of 18 to 24 inches below the creek bed, at a number of discrete locations. At this depth, the deposits are relatively inaccessible and not a human health or ecological concern. In 2010, ACEPD performed supplemental sediment surveys in areas not investigated in the initial study and found additional locations with tar deposits and staining (ACEPD, 2010a; ACEPD 2010b). Due to the relatively low contaminant concentrations found in the tarry materials and their inaccessibility, these areas are not expected to pose a risk to human health and the environment. In addition, due to the viscous nature of the tar and the presence of a top layer of "clean" sediment at almost all locations, the likelihood of mobilization of tar-affected materials is also relatively low. Nonetheless, Cabot Corporation (Cabot) has decided to excavate and remove tar from locations where significant accumulation has been observed and that can be accessed using removal equipment (*i.e.*, backhoes, *etc.*). The proposed action is expected to remove greater than 80% of the tar identified in the creeks, and the isolated tar deposits that are left-behind will be insignificant and inaccessible, and are not expected to pose risks to human health or the environment. Note, the proposed pine tar removal work is an interim action that targets the removal of significant tar deposits from the creeks and is different from the creek sediment remediation proposed in the US EPA Proposed Plan (US EPA, 2010). Overall, removal of the identified tar deposits is the most expeditious means of addressing the local community's concerns associated with these materials and

negates the need for complicated and time consuming assessment efforts. This work plan presents the approach to be used for the removal and off-Site disposal of tar.

2 Tar Removal Approach

2.1 Setting

Springstead Creek lies in the northern part of Gainesville in the Hogtown Creek Watershed. It is approximately 9,500 feet long and flows in a westerly direction from North Main Street and NE 34 Place and under US 441, where it joins Hogtown Creek (Figure 1). Springstead Creek is a sand-bottomed stream, averaging 2.75 meters wide and about 0.2 meters deep. The water in the creek reportedly rises up to 1 meter during storms. Land use in the creek basin is industrial and commercial in the upstream reaches and residential in the downstream portion before the confluence with Hogtown Creek (WAR, 2004).

The North Main Street Terrace Ditch runs north of the former Cabot property and intercepts flow from the North Main Street Drainage Ditch (Figure 1). After its confluence with North Main Street Ditch, the North Main Street Terrace Ditch flows through an undeveloped wooded area before it discharges into Springstead Creek (Figure 1). Stormwater runoff from the Koppers wood treating operations and runoff from NW 23rd Avenue combine in a drainage ditch that traverses the Koppers property from south to north and discharges to Springstead Creek just downstream of its confluence with the North Main Street Terrace Ditch (Figure 1).

Hogtown Creek flows in a southwesterly direction for several miles after the confluence with Springstead Creek near US 441 (Figure 1). Hogtown Creek is sand-bottom and is an average of 2.5 meters wide and 0.1 meters deep immediately downstream of the confluence with Springstead Creek. Water reportedly rises up to 1.6 meters above the base flow during storms. Banks are high and steep with evidence of erosion and clay outcroppings in places. Land use is primarily residential and commercial with some natural forest and industrial use (WAR, 2004).

As discussed in the ACEPD (2007) report, "…most of the Hogtown [and Springstead] Creek watershed is urbanized. In many areas, residential development has encroached on the creek. In several areas, the floodplain has been filled for development and the stream channelized. Sand smothering is very severe in the main channel between NW 45th Avenue to the forested wetland south of SW 2nd Avenue. In this area, the creek is devoid of aquatic vegetation, and contains large amounts of accumulated sediment (primarily sand) that is eroded and transported downstream during storm events" (ACEPD, 2007).

2.2 Sediment Characterization Studies

A series of studies have been conducted to characterize sediment and surface water quality within Springstead and Hogtown Creeks (EPA, 1980; IT, 1987; Hunter/ESE, 1990; ACEPD, 1994; ACEPD, 2006; ACEPD, 2007, ACEPD, 2009). While the objective of some of these studies was general characterization of conditions, others were undertaken in response to citizen observations of tar within the creek(s), *i.e.*, were biased towards areas believed to be affected by tar. The findings of these prior studies have been fairly consistent – noting the presence of low levels of volatile organics and semi-volatile organics, with the highest concentrations being detected in the same general areas. However, the recent ACEPD (2009, 2010a, 2010b) studies are the most comprehensive in scope, the best indicator of current sediment conditions, and a relatively accurate locator and delineator of tar deposits. Consequently, the discussion presented in the following paragraphs and sub-sections, and the proposed sediment removal plan, relies heavily on the findings of the recent ACEPD studies.

The ACEPD (2009) study, first of the three recent ACEPD studies, identified 10 tar areas. This study consisted of two components:

- First, a streambed reconnaissance survey was undertaken by Alachua County personnel by "walking the creeks and [North Main Terrace] ditch noting any areas of observable "tar-like" materials or heavy soil staining" (ACEPD, 2009). In addition, "a soil probe was used to evaluate the deeper sediments at all (emphasis added) sand bars and depositional areas within the stream and ditch to look for and document areas of buried contamination" (ACEPD, 2009). Based on discussions with the Alachua County field team, we understand that on the order of hundreds, and possibly more, locations in depositional areas were probed to identify tarry materials and/or visually stained soil/sediments. Since the tar is viscous and has a distinct color and odor, the use of a probe together with visual and olfactory observations proved to be an effective approach for delineating tar affected areas. Using this approach, the study identified approximately 10, relatively small, areas of tar-impacted sediments (Table 1; Figure 2).
- Second, a total of 25 sediment samples from 13 locations (a surficial and a deeper sediment sample at 12 of 13 locations) were collected for chemical analysis. The sampling locations were: based on the field observations (*i.e.*, biased to characterize tar impacts), located downstream of point sources (*e.g.*, Koppers), and also included two background locations.

The subsequent ACEPD sediment investigations (2010a, 2010b) focused on areas that were not investigated in the initial ACEPD study, which primarily targeted depositional areas. Visual and olfactory reconnaissance of these areas were undertaken using a similar approach to that previously used

by ACEPD. The study reportedly found additional locations with evidence of tar accumulation. These impacted areas, most of which were found just upstream of the confluence of Springstead and Hogtown Creeks, ranged from less than one cubic yard to greater than 100 cubic yards, with light to heavy staining.

Overall, the ACEPD studies were well designed/implemented and have successfully defined the tar impacted areas within the creeks. The sediment chemical characterization results of the 2008 ACEPD study indicate the presence of dioxins and polynuclear aromatic hydrocarbons (PAHs), although at relatively low concentrations. The results also indicate that the highest dioxin concentrations were found at sampling locations with low PAH concentrations. Given the poor correlation between dioxins and PAHs, the ACEPD report concluded that the dioxin impacts were not associated with the tarry material in the creeks but was likely due to other sources (ACEPD, 2009).

In general, concentrations in the surficial sediments (*i.e.*, materials potentially accessible to receptors) were lower than concentrations in the deeper sediment samples. An examination of the detected concentrations indicates that the tar deposits are not likely to pose significant human health and ecological risks, as discussed in Section 2.3. This is understandable given that pine tar is derived from pine trees and pine-related products have several household uses. Given the relatively low sediment concentrations (even though samples were biased to tar affected areas), the low risk to human health, the setting (*i.e.*, heavily urbanized with numerous sources of contamination, particularly PAHs), the presence of the tar is primarily an aesthetic issue and has raised concerns in the local community. Therefore, the proposed sediment removal is aimed at addressing the areas where significant tar accumulation was identified by ACEPD based on visual and olfactory observations. The remedial objectives are further discussed in Section 2.4.

2.3 Potential Human Health and Ecological Risks

2.3.1 Human Health Risks

Human health risks associated with potential exposures to sediments in Springstead and/or Hogtown Creeks have been assessed as part of two prior evaluations (Hunter/ESE, 1990; FDHRS/ATSDR, 1995). The Hunter/ESE risk assessment evaluated potential surface water and sediment exposure to adolescent recreators, whereas the FDHRS/ATSDR risk assessment evaluated chronic and continuous children exposure to sediments. Both these risk assessments concluded that sediments in Springstead and Hogtown Creeks did not pose significant risks to human health.

Additionally, the Florida Department of Health (FDOH) conducted a risk assessment utilizing the sediment data collected as part of the ACEPD (2009) study (FDOH, 2010). The FDOH risk assessment found that the risks to human health associated with current and future exposure to small amounts of PAH and dioxin impacted sediments in the creeks are not significant. The risk assessment also concluded that the risks associated with past exposure to PAH impacted sediments in the creeks were not significant.

The PAH concentrations in samples with heavy tar staining (*i.e.,* biased high) were compared to regulatory screening benchmarks (Figures 3 and 4). A comparison of the BAP-TEQ levels in creek sediments to the conservative Alternate Cleanup Target Levels (ACTLs) range of 0.5 to 1 mg/kg[1], developed by University of Florida for human health protection, indicated that any exceedances of the ACTLs were marginal, isolated, and in sediment that is currently not accessible (Figure 3). In addition, the arithmetic mean BAP-TEQ concentration for the creek sediment samples (0.6 mg/kg)[2], is within the range of proposed ACTLs. Thus, the PAH concentrations detected in creek sediments are not expected to pose a significant risk to human health.

2.3.2 Ecological Risks

The ACEPD field reconnaissance observations, the sediment chemistry data, the site visit on September 1, 2009, and other hydrologic studies (*e.g.*, ACEPD, 2007) provide a good indication of the potential ecological risks posed by the tar affected sediments to benthic invertebrates and other aquatic organisms. In general, the tar affected sediments are not expected to pose significant risks to environmental receptors for the following reasons:

- *Tar Depth:* Tar was found in sediments typically at depths greater than 8 inches below the creek bed, except at locations H4 and 75, where tar was found exposed at the surface. Benthic invertebrates and other organisms are generally found in the top six inches of sediments – referred to as the Biologically Active Zone – where tar was not typically found.
- *Comparison to Screening Benchmarks:* The State of Florida uses conservative sediment screening benchmarks, referred to as Threshold Effects Concentrations (TEC) and Probable Effect Concentrations (PEC), to assess potential risks posed to sediment dwelling organisms. A comparison of the measured sediment concentrations in the

[1] The ACTLs for BAP-TEQ were presented as a range by University of Florida to account for the potential presence of dioxins in sediment (*i.e.*, the BAP-TEQ ACTL is 1 mg/kg if dioxin is absent, and 0.5 mg/kg, if dioxin is present).
[2] Note, the state of Florida and US EPA guidance specifies that the average contaminant concentration within an exposure unit should be used to assess human health and ecological risks.

ACEPD study against these benchmarks indicates that PECs for PAHs were only exceeded in two shallow sediment samples (H4 and SS2)(Figure 4). Exceedances of the PECs for PAHs were also detected in deep sediment samples (Figure 4); however, the sediment benchmarks are not applicable to deep sediment samples (because benthic organisms are only present in shallow sediments)[3].

- *Site Visit Observations:* The Site visit on September 1, 2009 indicated Springstead and Hogtown Creeks to be relatively natural and thriving streams, despite the urban setting. Small fish and benthic organisms were observed in the sediment, even in areas where tar was present (*i.e.*, the presence of tar did not appear to be having an impact on aquatic/ benthic organisms). Stream bank erosion and evidence of storm water-mobilized sediments (sand) were clearly visible in the streams. These stream conditions are a result of the rapid development and urbanization of the Gainesville area, which poses the greatest threat to the creeks.
- *Benthic Invertebrate Surveys:* Habitat assessment and biological reconnaissance of Springstead and Hogtown Creeks has been conducted by the ACEPD (ACEPD, 2007). Although the scope of these studies is limited, these evaluations indicate that the benthic community within Hogtown Creek to be acceptable, and to be slightly impaired within Springstead Creek (ACEPD, 2007; EPA, 2009). However, the impairment in Springstead Creek appears to be associated with hydrological issues and is not contamination related (EPA, 2009).

Overall, since the tar impacted sediments are generally present at depth, current risks to environmental receptors are not expected to be significant. Although the tar-affected sediments are currently present at depth, we considered the likelihood of whether such sediments could be mobilized and brought to the surface, where environmental receptors could be exposed. The mobilization risk of sediments is low for the following reasons:

- The tar present in the Creeks is believed to have been released in 1966, *i.e.*, more than 40 years ago, when a developer demolished the former Cabot pine tar lagoons and released the contents to the North Main Street drainage ditch *via* a trench. The developer was reportedly fined by the authorities and asked to remediate the impacted sediments. News articles and other anecdotal information, immediately after the release, noted tar sightings in Springstead and Hogtown Creeks. A tar collection area is reported to have been setup near sampling location H4. This collection area was found in Hogtown Creek during the 2010 sediment survey, but did not show any evidence of tar contamination (ACEPD, 2010a). In addition, tar sightings in the Creeks in subsequent years by residents (ACEPD, 1994; ACEPD, 2006) were spatially consistent with the initial observations. Overall, the general areas where tar has been observed over time is consistent with the areas where tar was observed in the recent ACEPD study – indicating that the tar is relatively immobile.
- Tar was generally observed at depths greater than 8 inches in depositional areas of the creeks, with clean sediments overlying the tar. Given that the tar was found in

[3] Note, in addition to the PAH exceedances, the PEC for Di-n-butylphthalate was exceeded in the deep sediment sample collected at location S10; however, this exceedance is insignificant given the depth of the sample and because phthalates are a common laboratory contaminant.

depositional areas, with the passage of time additional "clean" sediments are expected to be deposited in these areas, leading to further occlusion (or isolation) of the tar-affected sediments. This deeper occlusion of the tar-affected sediments by clean sediments with time and the resulting need to conduct a deeper sediment investigation was discussed in the ACEPD (2006) report. Thus, the 2009 and 2010 investigations conducted by ACEPD included a survey of the deep sediments and confirmed that the tar generally remained buried at depth.

- Finally, pine tars have a high viscosity (approximately 3000 cp, Gradient, 2005), resulting in their "sticky" consistency, another factor that limits their mobility.

To summarize, the tar-affected sediments are not expected to be mobilized and brought to the surface, given that they have been found in the same general area for almost 40 years, their presence in depositional areas that are less prone to mobilization, and the presence of a relatively thick layer of clean overlying sediments. Consequently, both under current and future conditions, the tar affected sediments are not expected to pose significant risks to human health and to the environment.

2.4 Tar Removal Objectives and Approach

2.4.1 Removal Objectives

As discussed in the previous section, the tar-affected sediments are not expected to pose significant risks to both human health and the environment under current and future conditions. However, given that the tar, if and when it becomes exposed, has a distinct odor, is visually discernable, and is "sticky", the local community has been concerned about the tar's presence in the creeks. Consequently, Cabot is proposing to remove the tar-affected sediments in 19 areas defined in the ACEPD studies (Table 1; Figure 2). The proposed removal areas, which were discussed and agreed upon in a meeting with ACEPD, FDEP, USEPA and Cabot on November 4, 2010, include:

- All tar areas, except locations S-9 and S-10, identified in the ACEPD (2009) study;
- All tar areas that contained significant volume of impacted material (greater than 10 yd^3) and were proximate to the areas identified in the ACEPD (2009) study.

The proposed tar removal approach balances the environmental and human health benefit from the removal action with the harm caused in accessing the stream during the removal process. The proposed approach will remove tar from the most significant tar accumulation areas (*i.e.* North Main Terrace Ditch, downstream section of Springstead Creek, and key sections of Hogtown Creek) and will remove a majority (80%) of the estimated tar from the creeks (Table 1). The tar that will be left behind is present in

isolated segments (*i.e.*, limited volume – see Table 1), except for locations S-9 and S-10[4] (Figure 2). Due to steep creek banks and limited access roads, the S-9 and S-10 area is extremely difficult to access for not only removal equipment, but also potential human receptors. The total PAH and BAP-TEQ levels in this area are much lower than other impacted areas in the creek and do not exceed regulatory screening benchmarks (Figures 3 and 4). Concentrations of BAP-TEQ in the S-9/S-10 area sediments samples are lower than and/or within the range of ACTLs developed by the University of Florida (Figure 3). In addition the total PAH concentrations in sediment samples from the S-9/S-10 area are less than or approximately equal to the PEC value for PAHs (Figure 4). Consequently, tar from this area will only be removed from a localized section (area 75; Figure 2), where the tar is present at the surface. Additional sediment samples, both biased towards the tar and for general characterization, will also be collected to define PAH concentrations in the sediments that are not targeted for removal (*i.e.* S-9 and S-10 area).
The proposed removal will:

- Address the local community's concerns associated with the tar;
- Eliminate any risk of tar-affected sediment mobilization, although that risk is relatively low (Section 2.3);
- Address the majority of PEC exceedances associated with the presence of tar, although the tar-affected sediments are not expected to pose significant risks to environmental receptors (Section 2.3); and
- Address any potential human health risks associated with exposures to the tar-affected sediments, although such risks are not expected to be significant (section 2.2).

Overall, the proposed removal of tar affected sediments will provide further protection to human health and the environment and will also address the community related concerns associated with the presence of tar in the creek sediments.

2.4.2 Removal Approach

The primary objective for the proposed action is the removal of tar from the creeks. Tar affected sediment is readily identifiable in the field using visual and olfactory means; therefore, contaminant sampling for delineation is not warranted or necessary. Thus, a field reconnaissance approach that relies on visual and olfactory observations (rather than contaminant concentrations) will be used to define the extent of the proposed sediment removal. In addition to the tar impacts being clearly discernible in the field, the presence of Hawthorn clay deposits at the base of the stream bed is extremely useful, and will be utilized to define the vertical extent of impacts. Conceptually, the following steps will be undertaken to conduct the sediment removal:

[4] Note, location 14 is proximate to S-10 and is considered part of the S-10 area (Figure 2).

1. In each of the areas pre-selected for removal (Table 1; Figure 2), Cabot, with assistance from ACEPD, will undertake additional field delineation using a stainless steel sediment probe. Visual and olfactory data will be used to accurately define and mark the lateral and vertical extent of tar-affected sediments requiring removal.

2. In each area, the thickness of "clean" sediments that overlie the tar-affected sediments will be defined for potential segregation/reuse during sediment removal.

3. Once the tar-affected sediments have been delineated in each area, sediments will be removed using either manual or mechanical techniques (see Chapter 3). To the extent possible, clean, surficial sediment, will be be segregated, staged and reused. Excavated sediments will be placed in a dewatering box (*i.e.*, a specially designed roll-off container).

4. The excavated sediments will be transported to and stored at a central staging area. Water accumulated during excavation and dewatering activities will be disposed of at either the Cabot lift station or at an off-site disposal facility.

5. Once the sediments have dried, they will be transported to an authorized waste disposal facility (see Chapter 3 for details).

6. Either segregated clean sediments or available sediments in the creek will be used to fill-in the removal areas.

7. Although the removal action is not being undertaken to address potential risks associated with chemical exposures, limited confirmation sampling will be performed after tar removal from the creeks has been completed. Cabot will work with FDEP and USEPA to develop the scope and details of the sampling plan.

The next section of the report provides additional details of the means and methods to be used to conduct the proposed sediment removal work.

3 Detailed Tar Removal Plan

This section describes the overall approach for removal and disposal of the tar deposits identified in Springstead and Hogtown Creeks. Adjustments to the proposed methodology may be necessary during sediment removal based on factors such as site conditions, access issues and regulatory requirements. A more detailed discussion of the logistics of the project is presented in the Pollution Prevention Plan (Appendix A).

3.1 Pre-mobilization Activities

Pre-mobilization activities for the stream restoration efforts will include waste characterization, development of the site specific health and safety plan, as well as establishment and preparation of the site staging area. A description of these activities is provided below.

3.1.1 Waste Characterization

Representative samples of the tar deposits targeted for removal have been collected and characterized for disposal. Based on this characterization, the material is a non-hazardous waste and will be thermally treated at the Clark Environmental's high temperature thermal treatment facility located in Mulberry, Florida.

3.1.2 Health & Safety Plan

A site specific health and safety plan (HASP) in accordance with OSHA requirements will be prepared prior to mobilization for field activities. This document will include a summary of relevant site history, a task by task hazard assessment of physical, chemical, radiological, and biological hazards. The HASP will also include a description of the planned air monitoring program, including instruments to be used and action levels. Additionally, the HASP will contain a description of health and safety equipment requirements, a decontamination plan, a traffic control plan and an emergency response plan.

The anticipated level of protection for the workers excavating and handling the soil is modified Level D. Modified Level D is used where there is the potential for skin contact with contamination but respiratory protection is not required. Pine tar is an extremely thick, viscous and sticky material, and

thus, workers removing and handling the tar deposits will be wearing disposable tyvek suits, rubber boots/waders and gloves. Those in the immediate excavation areas may also wear respirators as a precautionary measure, depending upon results of air monitoring conducted at the site. Supervisors and other workers outside the immediate excavation zones will not need protective clothing or respiratory protection.

3.1.3 Odor Control

Pine tars have compounds called terpenes, which have exceptionally low odor thresholds. The levels of terpenes in pine tar are especially strong, as anyone who has handled freshly cut pine logs or Christmas trees will recognize. The concentrations of terpene odors from pine tar are not toxic and do not pose a health concern. Nevertheless, extra effort will be taken to keep odors to a minimum and air quality will be monitored. The site specific Health & Safety Plan will provide details regarding the air monitoring plan associated with project implementation. Odor control efforts will include keeping stockpiled tar covered with plastic sheeting as much as possible and using other odor control measures (e.g. kiln dust and/or activated carbon containing fabric). However, given that these tars are very odorous, people may occasionally smell something. Thus, a local contact name and number will be provided to the agencies during the pre-mobilization activities, and Cabot representatives will work closely with ACEPD to manage this issue, if it arises.

3.1.4 Work Staging Area

Completion of the tar removal will require establishment of excavation exclusion zones and a work staging area. An exclusion zone will be set up immediately around the excavation area using barrier tape. Only workers who have appropriate training and certifications and are wearing the required personal protective equipment (PPE) will be allowed in the exclusion zone. A second zone will be set up for the removal of PPE and cleaning of equipment.

Approximately half to one acre of land is needed for the work staging area. The staging area should be generally secure and flat with a minimal amount of surface obstructions (e.g., trees, roots, large rocks, debris). The staging area will be used to store the excavated sediments prior to transportation to the disposal facility. It will also be used for equipment and work materials storage, as well as a central meeting location for the work team. WESTON will work closely with the City of Gainesville to determine appropriate access points to the staging areas from the public right of way, when applicable.

3.1.5 Site Preparation

Prior to mobilization, WESTON and its subcontractors will conduct a site walk through to designate a work staging area and to clearly designate the sediment removal locations and exclusion zones. During site preparation, the staging area will be secured and prepared for delivery of equipment. Once the staging area is prepared, arrangements will be made to schedule and coordinate delivery of equipment and mobilization of personnel to the site. Underground and overhead utility location searches will also be conducted during site preparation. WESTON will work closely with the City of Gainesville to determine appropriate access points to the creeks from the public right of way, when applicable.

3.2 Stream Restoration Activities

A discussion of the means and methods to be used for the stream restoration activities is provided below. The work to be performed includes mobilization of personnel and equipment, sediment removal, accumulation of sediment at the staging area, transportation and disposal of the sediments and water (if accumulated), restoration of the excavated area, and demobilization of personnel and equipment.

3.2.1 Mobilization

Once sufficient site preparations have been made, necessary personnel and equipment will be mobilized to the site. Mobilization will be conducted in an efficient and orderly fashion. A daily health and safety related briefing will be held with the work team to communicate key topics of the health and safety plan and to allow the work team time to review the plan and ask questions. Daily work activities and special precautions or instructions will be reviewed.

3.2.2 Tar Removal

Tar deposits will be removed from 19 locations in the North Main Terrace ditch, and Springstead and Hogtown creeks (Figure 2). Table 1 contains the location designation, expected dimensions and sediment removal volume, and other relevant information for all tar-impacted sediment locations identified by ACEPD (2009, 2010a, 2010b). As indicated in Table 1, the sediments in these locations will either be excavated, further investigated, or left behind. Based on the ACEPD investigation, shallow sediments at a few locations are not expected to be impacted with tar deposits. To the extent practical,

clean shallow sediments will be set aside and used for backfill. Work will be planned so that the excavations are not left open overnight.

Prior to excavation, Cabot personnel will use an insulated soil probe rod to clearly delineate and mark the lateral and vertical extents of the area containing tar. ACEPD staff will provide limited assistance in this delineation effort. Previous investigations at the Site conducted by ACEPD have shown that the tar adheres to the shaft of the probe, making this method effective in locating tar impacted sediments. Additionally, the creek bed will be cleared of obstructions (e.g. logs, debris, etc.) to allow access to the excavation sites. Debris cleared from the work area will be accumulated in roll-off containers for off-Site disposal.

With a few exceptions, all locations with evidence of significant tar contamination will be removed (Table 1). As previously discussed, the S-9/S-10 area is difficult to access and contains low levels of PAHs, and thus, will not be excavated. Only tar deposits exposed at the surface in this area (location 75) will be removed and additional sampling will be performed to characterize the PAH concentrations in the sediments left behind.

Sediment excavation and removal will be undertaken using light equipment, except at location 75, where the tar at the surface will be removed manually. Details of the approach to be used for tar-affected sediment removal is presented in the Pollution Prevention Plan (Appendix A). A water control system will be established at each excavation point. Details regarding water control methods are described in the Pollution Prevention Plan (Appendix A) Once continuous rainfall begins, plans will be made to remove equipment and personnel from the creek.

The excavated sediment will be transported to the staging area in dewatering boxes that are designed to separate and hold water in the lower chamber, and thus, not leak. As detailed in Appendix A, the sediment staging area will be arranged in such a way as to allow collection of any residual water that drains from the sediment. The dewatered sediment will remain covered as much as possible in the staging area to facilitate odor control. When the sediment has dried enough for truck transport and a sufficient volume of sediment has been accumulated at the staging area, it will be loaded onto trucks for transport to the designated disposal facility. Liners will be used in the trucks for any sediment that has excess moisture and deemed to be at risk of leaking during transport to the disposal facility. A representative sample of sediment will be placed in a clear container and shaken to simulate transport. If no significant amount of free water is observed, the sediment will be considered ready for transport. If

necessary, kiln dust may be added to the sediment to decrease water content. Water accumulated during the sediment excavation or storage will be placed in appropriate storage containers at the staging area. The recovered water will be discharged to the lift station if the chemical concentrations are within permit discharge limits. An off-site disposal facility will be used for recovered water that cannot be discharged to the lift station.

Prior to backfilling the excavated areas with clean sediment materials, the limits of removal at each location will be surveyed using a GPS device, and the depths of excavation/observation will be documented. Additionally, as previously discussed, limited confirmatory sampling will be performed following sediment removal. Cabot will work with FDEP and USEPA to develop the confirmatory sampling plan for the project.

3.2.3 Transportation and Disposal of Tar

Transportation manifests will be prepared for the contaminated soils prior to disposal. The excavated sediments will be transported via truck from Gainesville, Florida to Clark Environmental's thermal treatment facility that is located in Mulberry, Florida. The sediments will be thermally treated to destroy the contaminants. Clark's Mulberry facility is permitted under F.A.C. 762-613 (Soil Treatment Facilities). Any residuals from the thermal treatment will be disposed at Clark's waste processing facility permitted under F.A.C. 16-701 (Solid Waste Management Facilities) or used as clean fill in accordance with F.A.C. 62-713. Certificates of Treatment and Certificates of Disposal will be obtained.

3.2.4 Restoration of Excavated Area

The excavated area will be restored by using native sediment from within the creeks to ensure that no large depressions are present in the creek bed. Additionally, every effort will be made to restore properties used for access to excavation areas to preexisting conditions. Refer to Appendix A for details.

3.2.5 Demobilization

Once sediment removal has been completed at the designated locations, equipment and the personnel will be demobilized from the site. The work staging area will be dismantled once the accumulated sediment has been removed. All materials and equipment will be removed from the work

sites and staging area. The staging area will be returned to pre-mobilization condition to the extent practicable.

3.3 Documentation

3.3.1 Field Documentation

The field activities will be documented in a site specific field log book. This logbook will be maintained by the WESTON site manager. Information to be recorded in the log book will include time, date and description of the daily activities performed during the implementation of the stream restoration efforts. Other documentation will include photographs of the work performed, GPS coordinates for the excavated areas, waste transportation manifests, as well as health and safety related forms and reports, including air monitoring reports, instrument calibration, and documentation of daily tailgate safety briefings.

3.3.2 Completion Report

WESTON will prepare a report documenting the tar removal activities. This report will include a description of the work performed, maps showing the locations and volume of sediments removed at each location, photographs documenting the work performed, and supporting documents, including disposal certificates.

4 Schedule

It is anticipated that approximately 35 work days will be necessary to implement the removal plan. The optimum time to perform this work is during the winter months when foliage is minimal and precipitation is low. Consequently, the proposed work will be implemented between January and February 2011, provided property access can be obtained.

5 References

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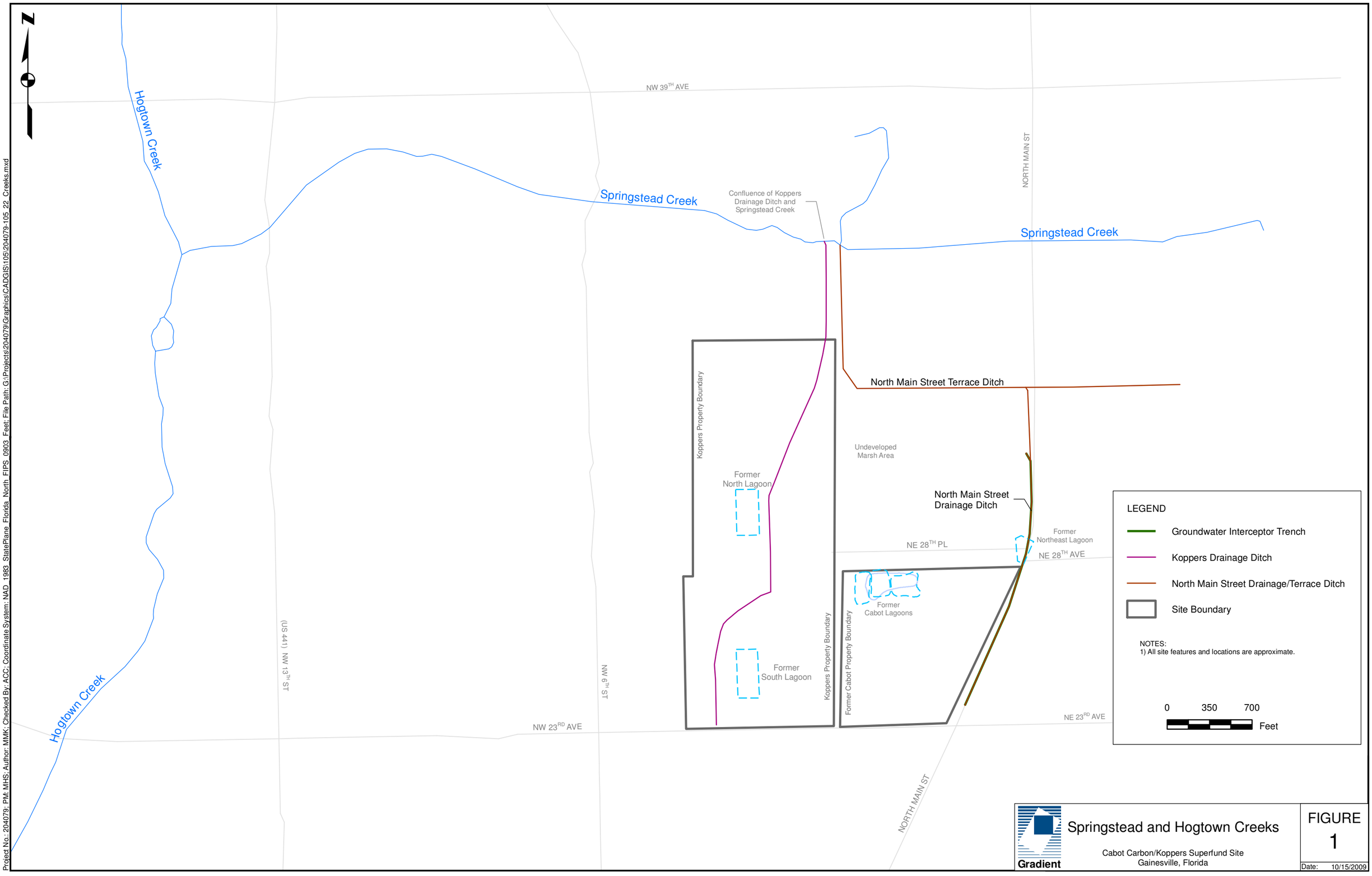
Tables

Table 1
Summary of Tar-Impacted Sediment Locations
Cabot Carbon/Koppers Superfund Site, Gainesville, FL

GPS Point/ Sample ID	Staining	Length (feet)	Width (feet)	Depth (feet)	Cubic Yards	Sediment Removal	Comments
Sediment Removal Locations							
SS5	Heavy staining and strong odor	20	10	4	30	Yes	Estimated volume
SS2/SSA	Heavy staining and strong odor	20	10	4	30	Yes	Estimated volume
S4/SC	Strong odor	30	20	4	89	Yes	Estimated volume
SD/S3/10	Strong odor	20	20	4	59	Yes	Estimated volume
SA/SE/S1	Heavy staining and strong odor	30	20	4	89	Yes	Estimated volume
HB/H7	Strong odor	30	20	4	89	Yes	Estimated volume
H4	Heavy staining and strong odor	30	20	4	89	Yes	Estimated volume
H4A/1	Heavy staining and strong odor	40	12	4	71	Yes	Measured dimensions
HA	Strong odor	30	20	4	89	Yes	Estimated volume
56	Heavy	--	--	2	--	Yes	
59	Slight to moderate	--	--	--	--	Yes	Buried in point bar; proximate to location SD/S3
13	Heavy	50	20	3	111	Yes	Proximate to Location SC
75	Heavy	40	10	3	44	Yes	Only tar deposits exposed at surface to be removed manually due to limited equipment access.
58	Heavy	15	10	4	22	Yes	Proximate to Location SD/S3
9	Very heavy	10	15	2	11	Yes	Proximate to Location SD/S3
6	Moderate	10	15	2	11	Yes	Measured dimensions
62	Moderate	10	8	4	12	Yes	Measured dimensions; 2 spots on either bank
61	Moderate to heavy	2	2	4	1	Yes	Measured dimensions
60	Heavy	20	4	3	9	Yes	Proximate to Location SD
Locations to be Further Investigated							
S10	Heavy staining and strong odor	18	18	5	60	No	Tar from this area will not be removed due to limited equipment access; supplemental sampling will be undertaken to define concentrations left in-place.
S9	Heavy staining and strong odor	20	10	4	30	No	
14	Heavy	50	10	3	56	No	
Locations with Insignificant Staining/Limited Volume - No Removal Needed							
8	slight to moderate	12	6	3	8	No	
5	slight	20	5	2	7	No	
66	moderate	10	10	2	7	No	
78	heavy	12	4	3	5	No	
79	moderate to heavy	10	4	3	4	No	
102	moderate to heavy	6	6	3	4	No	
7	slight to moderate	10	5	2	4	No	
73	moderate to heavy	8	5	2	3	No	
63	moderate	10	3	2	2	No	
54	heavy	6	3	3	2	No	
12	heavy	6	4	2	2	No	
71	heavy	6	4	2	2	No	
50	slight	5	2	4	1	No	
67	moderate to slight	5	4	2	1	No	
69	slight	6	3	2	1	No	
72	slight to moderate	6	3	2	1	No	
76	moderate to heavy	6	3	2	1	No	
53	slight to moderate	3	3	3	1	No	
57	heavy	3	3	3	1	No	Several small spots
2	moderate to heavy	4	2	3	1	No	
77	slight	5	2	2	1	No	
64	moderate	3	3	2	1	No	A little on right bank 10' downstream of flagging
11	slight to moderate	4	2	2	1	No	
4	slight to moderate	3	3	1	0.33	No	
70	slight to moderate	2	2	2	0.30	No	
101	moderate	2	2	2	0.30	No	
105	slight	2	2	2	0.30	No	
3	slight	3	2	1	0.22	No	
49	moderate	1	1	4	0.15	No	
51	heavy			< 0.5	0.15	No	
74	slight to moderate			2	0.15	No	2 spots on either bank
52	slight	1	1	2	0.07	No	
55	moderate	1	1	2	0.07	No	
65	heavy	1	1	2	0.07	No	
68	moderate	1	1	2	0.07	No	
104	slight	1	1	2	0.07	No	
106	slight	1	1	1	0.04	No	Could not replicate staining
15	slight	1	1	1	0.04	No	Could not replicate staining
16	slight	1	1	1	0.04	No	Could not replicate staining
		Total Volume of Impacted Sediment			**1,067 cubic yards**		
		Total Volume of Sediments to be Removed			**856 cubic yards**		
		% of Impacted Sediment to be Removed			**80.2%**		

Figures



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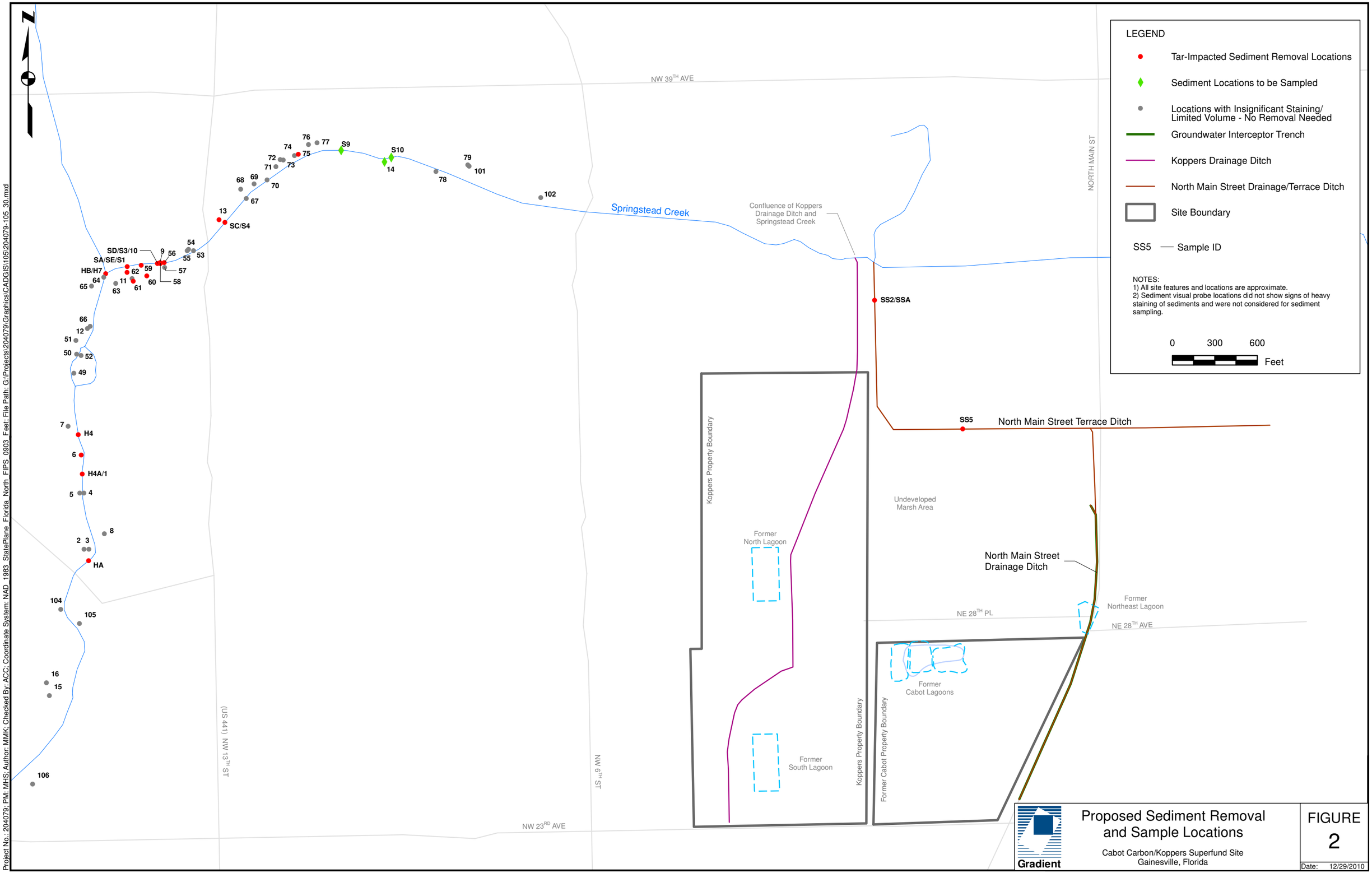

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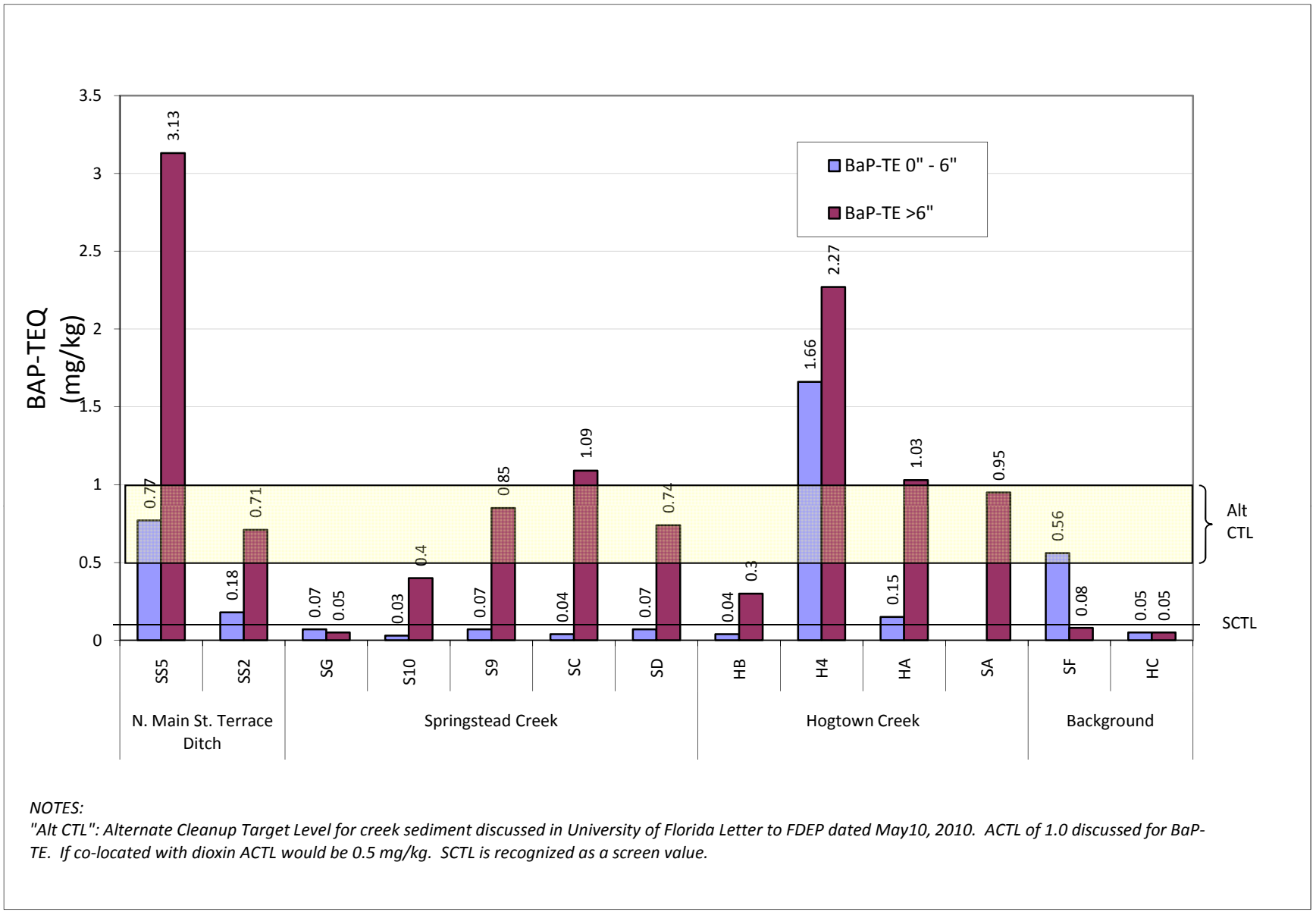
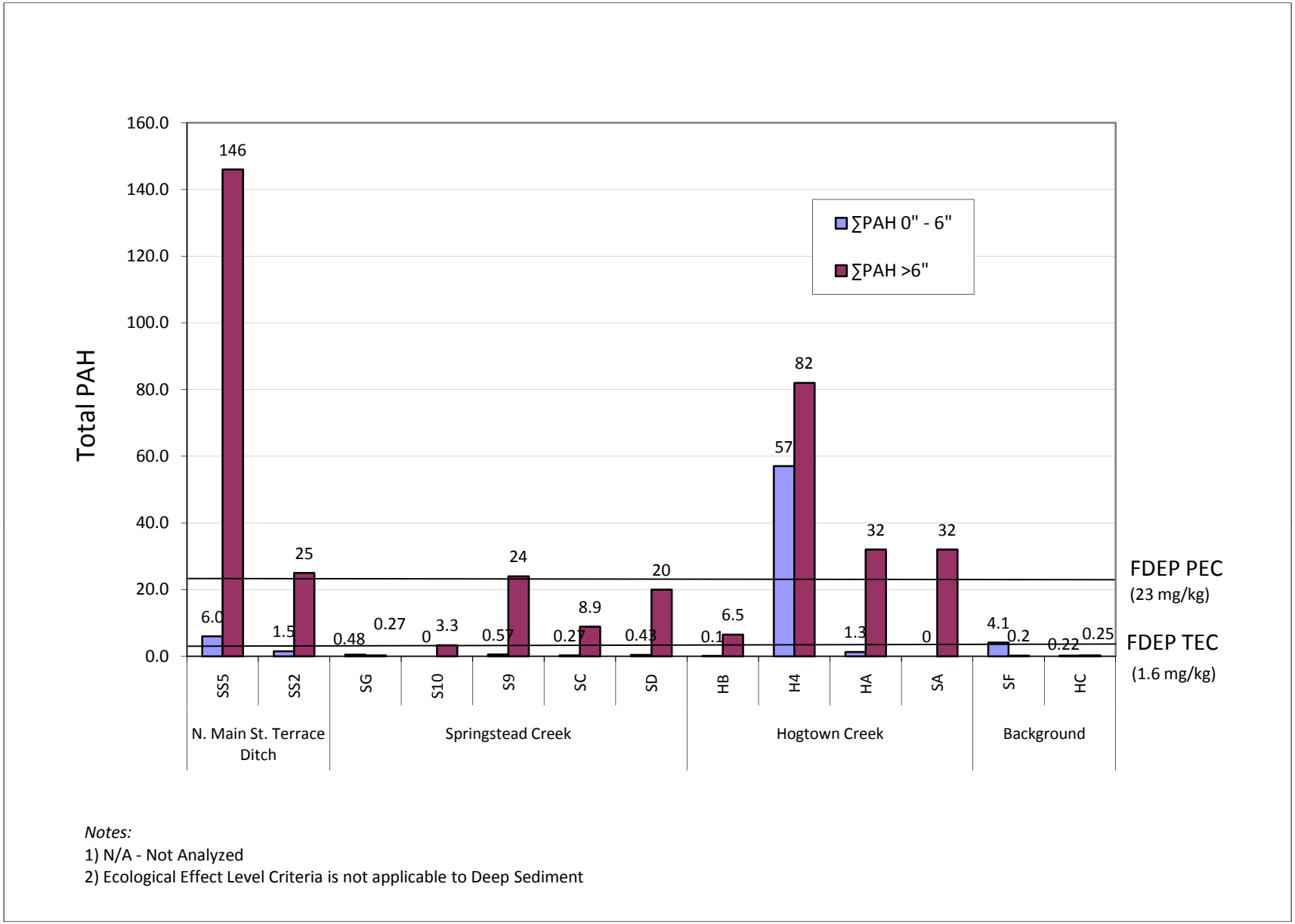
Figure 3
Sediment Data: BAP-TEQ Levels



NOTES:
"Alt CTL": Alternate Cleanup Target Level for creek sediment discussed in University of Florida Letter to FDEP dated May10, 2010. ACTL of 1.0 discussed for BaP-TE. If co-located with dioxin ACTL would be 0.5 mg/kg. SCTL is recognized as a screen value.

Figure 4
Sediment Data: Total PAH Concentrations



Notes:
1) N/A - Not Analyzed
2) Ecological Effect Level Criteria is not applicable to Deep Sediment

Appendix A

Pollution Prevention Plan for Tar Removal
Springstead & Hogtown Creeks
Gainesville, Florida

Pollution Prevention Plan for Tar Removal
Springstead & Hogtown Creeks
Gainesville, Florida

Cabot Carbon/Koppers Superfund Site
Gainesville, Florida

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January 2011

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Table of Contents

1.0 INTRODUCTION & SITE INFORMATION

This document is a supplement to and attachment of the updated Tar Removal Work Plan for Springstead & Hogtown Creeks in Gainesville, Florida dated December 3, 2010. This Pollution Prevention Plan provides additional information regarding site access, water control, sediment excavation, sediment dewatering, backfilling, and sediment staging. This document also includes best management practices (BMPs) and contingency planning related to surface water quality and turbidity control during sediment removal and backfilling operations. Figure 1 shows the sediment removal locations and surrounding property ownership. Attachment 1 shows photographs of equipment to be used. This revised document addresses comments received from The Florida Department of Environmental Protection, The City of Gainesville and The Alachua County Office of Environmental Protection.

The nature of the planned activity is to remove tar stained sediments from approximately 19 locations along Springstead and Hogtown Creeks in Gainesville, Alachua County Florida. The general sequence of activities is provided in Table 1. The estimated duration of the project is approximately 35-40 work days. The plan is to conduct the sediment removal during the next dry period that follows completion of acquiring property access. The total site area is scattered over approximately 2 miles of Springstead and Hogtown Creeks. The total area to be disturbed is conservatively estimated to be less than 1.2 acres, with the majority of the disturbance associated with creating the access routes to the stream bank (0.5 acre). The total area to be excavated is approximately 0.16 acre.

Table 1 Summary of Work Sequence

Activity Description	Estimated Duration (Days)	Comments
1. Mobilization & Staging Area Preparation	2-4	Total
2. Creation of Access Paths	0.5	Per Removal Zone (10 Zones)
3. Establishment of Turbidity & Water Control Systems	0.5	Per Removal Zone (10 Zones)
4. Sediment Excavation, Dewatering, Transport to Staging Area, & Partial Backfilling	1	Per Removal Zone (10 Zones)
5. Removal of Water Control System	0.5	Per Removal Zone (10 Zones)
6. Removal of Turbidity Control System	0.25	Per Location (10 Zones)
7. Site Restoration	0.5	Per Location (10 Zones
8. Soil Loading & Transport to Disposal Facility	Ongoing Throughout Excavation	
9. Staging Area Restoration & Demobilization	2-4	Total

Activities 3-7 will be repeated at each removal location.
Activities 2, 7 & 8 will be conducted concurrently with other sediment removal activities.
Durations do not include weather delays.
Activity durations assume a single staging area can be used to prepare and load the soils for transport to the disposal facility.

2.0 SITE ACCESS

Access will be requested from property owners to access the Creeks where tar removal is planned and from adjacent properties as needed to allow creation of safe access routes to the creek bank. Site specific conditions at each location present different challenges to successfully removing the tar containing sediments. The general desire and agreed upon plan is to use commercial properties as the access routes as much as possible. In instances where there are multiple removal locations close together (e.g., SA and SD or 56,58 ,S3), the sediment removal will be completed from a single access point, if possible (See Figure 1). Table 2 depicts the access strategy for each removal location.

Table 2 Site Access Plan Summary

Removal Location	Parcels Numbers Requiring Access	Planned Access Route	Latitude*	Longitude*
SS 5	12, 13,14, 15	14 & 15	82.32253	29.68154
SS2/SSA	N. Main Terrace Right of Way	N. Main Terrace Right of Way	82.32435	29.68420
SC/S4	1, 27	27	82.33886	29.68594
SD/S3/10	2,3,6,7,8,20	6,7, or 8	82.34035	29.68508
SA	3,6,7,20	6,7, or 8	82.34076	29.68480
HB	0,32,20	0 or 20	82.34154	29.68493
H4	4,5,,10,11	4, 5, 10, or 11	82.34220	29.68191
H4A/1	9,29,30	9	82.34160	29.68105
HA	30	30	82.34201	29.67951
6	29,11	29, 9 or 11	82.34203	29.68143
9	6,7,3,8	6,7, or 8	82.34019	29.68513
10	6,7,8,20	6,7, or 8	82.34044	29.68509
13	1,27	27	82.33886	29.68594
56	2,3, 6,7,8	6,7, or 8	82.34010	29.68513
58	2,3,6,7,8	6,7, or 8	82.34019	29.68512
59	6,7,20	6,7, or 8	-82.34061	29.68509

Removal Location	Parcels Numbers Requiring Access	Planned Access Route	Latitude*	Longitude*
60	6,7,20	6,7, or 8	-82.34049	29.68488
61	3,20,6,7,8	6,7,or 8	82.34080	29.68478
62	3,20,6,7,8	6,7,or 8	82.34093	29.68495
75	25,22,24	24 or 22	-82.33707	29.68718

* Latitude & Longitude from Alachua County EPD August 2009 Sediment Quality Study& October 2010 Supplemental Report.

Planned access routes may be adjusted in response to actual property access obtained.

3.0 WATER CONTROL

The recommended water control approach is to use stackable water filled “Jersey” style HDPE constructed highway barriers and/or an Aqua Barrier (water filled elongated HDPE tube with internal baffles) to construct upstream and downstream coffer dams (See Page 3 of Attachment 1). Figure 2 shows the layout of the water control set up. Impermeable plastic sheeting and sand bags will be used to seal the edges and seams of each type of modular dam. The coffer dams can be filled with water from the creek. An electric submersible pump and associated piping will be used to pump the water from behind the coffer dam (Page 4 of Attachment 1). A second dam will be installed using similar materials downstream of the excavation zone to isolate the work zone and control downstream turbidity. Water will be pumped from the creek bed to reduce the amount of water in the excavation.

The construction of coffer dams using HDPE barriers and aqua barriers are proven devices and methods employed on environmental projects where stream flow management in creeks is required. The size of the streambed area to be water controlled will be established based on an area that can be excavated in 1 day. Additionally, weather forecasts and weather conditions will be monitored daily to further calculate the control area size and avoid conducting the sediment removal during storms.

Because excavation at location 75 will be performed by hand and less intrusive, water control measures at this location will be simplified. Water control measures in this excavation area will be limited to placement of sand bags immediately around and adjacent to the excavation/source removal point. The main objective in this location is to remove exposed tar deposits above the stream bed grade. The removal action in this area shall be by manual digging, is not expected to exceed 1-cubic yard of material, and shall cease whenever water

infiltration commences and or exposed material above grade is removed. This area will be backfill with existing clean sediment.

4.0 SEDIMENT EXCAVATION

The basic excavation tool recommended is a CAT 301 excavator or equivalent (See Page 2 of Attachment 1). This equipment has been chosen for it's relatively narrow width (3 ft 3 inches) and low ground pressure to allow minimum disturbance and impact and to be as less intrusive as reasonably possible. It can be lifted into the stream bed, if needed. Sediments will be placed either in a front end loader or into 1 ton capacity Super Sacks (see Page 6 of Attachment 1). A Lull Telehandler or equivalent will be used for both lifting and as a front end loader (See Page 7 of Attachment 1). A CAT 308 track mounted excavator or equivalent will be used to empty the Super Sacks into a dewatering box (specially designed roll-off container) and to load dewatered stockpile soils for off-site disposal. It can also be used clear paths to access the stream bank.

Super Sacks will be used as the sediment transport device in areas where access to the creek bank is limited and the dewatering box(es) cannot be direct loaded (See Page 6 of Attachment 1). The Super Sacks will be fitted with plastic liners and equipped with draw string discharge for ease of emptying. A track mounted articulating dump truck will be used to transport the Super Sacks (See Page 7 of Attachment 1). This vehicle rotates on it's chassis, requiring limited turnaround space (reducing the amount of clearing needed) and can climb steep grades.

Interlocking plastic mats (See Page 5 of Attachment 1) may be used to move up and down the stream banks at the access points and within the stream bed. Additionally, sectional bridges may be used to traverse the stream in areas where access is difficult and grading to improve bank access conditions would be too invasive in order to facilitate moving up and down the stream banks.

Grading of the stream banks will be avoided to the extent possible while maintaining safe operational conditions for personnel and equipment. Access to the stream banks will be through upland areas and wetlands associated with the flood plain of the stream will be avoided.

The limits of excavation at each location will be staked and documented with GPS device that has an accuracy of approximately 1 meter. This information along with the information on the vertical extent of excavation will be documented in the Removal Action Report.

5.0 SEDIMENT DEWATERING

Water tight steel roll-off containers specifically designed for dewater applications (i.e., dewatering boxes) will be used to dewater the excavated sediments. Sediment will be placed in these special purpose roll-off containers equipped with screened bottoms that allow water to gravity drain from the sediments. Air moving trucks or air operated diaphragm pump(s) may be used to accelerate the dewatering (See page 8 of Attachment 2). The contact water will be collected in tanks for characterization and disposal. The recovered water will be discharged to the lift station if the chemical concentrations are within permit discharge limits. An off-site disposal facility will be used for recovered water that cannot be discharged to the lift station. The roll-off containers or dewatering boxes will be transported to the staging areas for stockpiling and further drying. Water absorbing material (e.g., polyacrylamide gel , fly ash, or Portland, cement) will be kept on hand and used to absorb water that remains in the sediment as needed.

6.0 TURBIDITY CONTROL & MONITORING

The sediment removal activities have the potential to create turbid conditions downstream of the tar removal work areas. The key phases of work where turbid conditions can occur include establishment of the water control system, sediment excavation and backfilling with nearby stream sediments, wherever possible, as well as removal of the water control system. The planned approach to controlling turbidity and the associated monitoring are described below.

The downstream coffer dam is expected to greatly reduce the potential for release of turbid waters from the work area. Water filtering materials will be installed downstream of the work area, prior to installing the water control system at each location. These may include hay bales and wattles, depending on the water depth. The water filtering devices will be fastened to the stream bottom with wooden stakes. Additional rows of water filtering devices will be added as needed to maintain the downstream turbidity within 29 units over background. The water filtering devices will be replaced as needed if sediment begins to clog the devices. The downstream turbidity control devices will be inspected daily for integrity and effectiveness. When continuous rainfall is expected, the erosion control devices will be removed from the stream and reinstalled after the rain event and high discharge subsides. Erosion control devises that are lost during storm events will be recovered and removed from the stream. Turbidity control devices will be removed as soon as possible once the work is completed in a given area.

Turbidity will be controlled from the pump around discharge pipe with either a turbidity bag/geotube or a series of perforated pipes. The turbidity bag will be used in lower flow conditions and the perforated pipe arrangement, if needed, will be used for higher discharge volumes. The contingency plan for controlling turbidity associated with the pump discharge is to use a longer turbidity bag or additional sections of perforated pipe.

To enhance dewatering efforts from below the streambed elevation and from within the gravel subgrade, as well as to reduce the potential for pump blockage, the pump will be placed inside a container such as 55-gallon drum to isolate the pump from the surrounding sediment, allowing for more effective and consistent operation of the pump. The container will be wrapped with a geotextile fabric with a pore size that is small enough to protect the pump from fouling, but large enough that the geotextile does not become plugged with trapped sediment.

The turbidity monitoring plan has been developed to comply with Florida Administrative Code Chapter 62-302(Surface Water Quality Standards). Turbidity monitoring will be performed at the onset of in stream activities and continue during tar removal activities including the establishment of water control, excavation/ backfilling, and removal of the water control structures. Turbidity measurements will be taken within 1 hour of beginning work and every 2 hours thereafter until construction activity in a given area is ceased. A turbidity meter will be used to measure in stream turbidity 50-ft upstream of and immediately downstream of the last erosion control device. The turbidity meter will be calibrated daily in accordance with the manufacturer's specifications. Turbidity measurements and meter calibration will be documented in the field log book or on a field data collection forms. The resulting upstream measurements will be considered background turbidity for the individual location If turbidity measurements exceed 29 Nephelometric Turbidity Units (NTU), then contingency measures described in Section 10 will be implemented to reduce the downstream turbidity measurements to 29 NTU above background.

A daily update on work activities including turbidity monitoring data and inspection reports will be provided to appropriate regulatory personnel via email or fax.

7.0 BACKFILLING

Discussions with representatives of The City of Gainesville and Alachua County EPD personnel have indicated that local governments are spending substantial sums of money to routinely remove sediments from the creek that accumulates near downstream weirs. With this in mind, replacing the removed sediment with clean backfill is not desirable. Excess sediments in nearby un-impacted sand bars will be used to partially fill the excavated areas to reduce the potential for bank erosion and minimize potential hazards associated with leaving a hole in the stream bed. To the extent possible, clean surface sediments will be used as backfill to reduce the potential of reintroducing tar impacted sediments into the excavated areas. This material will be placed using the equipment described in Section 4. Backfilling with nearby sediments will be conducted prior to the removal of the water control structures.

8.0 Soil Staging Area

To prevent contact between the ground surface and the excavated sediments and to contain water that drains from the soils, a durable impermeable plastic liner, at least 40ml in thickness will be placed on the ground beneath the soil staging area. Hay bales will be placed approximately 5-10-feet from the edge of the liner and the liner will be lapped over the hay bales to facilitate containment of any run-off associated with soil pile. The soil staging area will be sloped to a designated corner of the sheeting. A lined sump will be placed in this area of the sheeting. Water collected in the sump will be pumped into a tank for disposal and treatment. The recovered water will be discharged to the lift station if the chemical concentrations are within permit discharge limits. An off-site disposal facility will be used for recovered water that cannot be discharged to the lift station. Figure 2 contains detail of the soil staging area lay-out. The location of the staging area and related transportation routes will be identified and communicated to regulatory agencies prior to mobilization.

9.0 RESTORATION

Due to the relatively steep slopes and thick tree canopy that slows vegetative growth, bank erosion is a concern. Equipment will operate from interlocking mats in some instances to make safer more stable platforms and to limit land disturbance caused by more intrusive bank access methods (See Page 5 of Attachment 1). These mats have been used successfully in soft/wet soil conditions to provide a stable platform for movement of equipment and materials.

The stream access points will be restored to like conditions and erosion reducing Biologs and/or mating will be placed on the stream banks as needed to allow the banks favorable conditions to recover. The preference is to use biodegradable materials (e.g., coconut coir pith logs packed in tubular netting and/or loose weave burlap material) to the extent possible. The areas will be restored sufficiently to the previous condition to prevent newly exposed soils from erosion and transport in accordance with FDEP storm water regulations. Trees that are removed will be replaced in accordance with local tree ordinances. The City of Gainesville will be contacted to acquire permits for tree removal or to access areas that require a special permit.

Upon completion of the work, all equipment & materials will be removed from the staging area. Areas of exposed soils will either planted with grass or covered with gravel, mulch etc. depending on the needs of the individual property owner.

10.0 Best Management Practices & Contingency Planning

Best Management Practices (BMPs) will be employed during the tar removal action to control downstream turbidity. Primary BMPs will include installation of hay bales or wattles in the stream bed immediately downstream of each work area. These devices will be installed prior to the installation of the coffer dams and will remain in place until the coffer dams are removed and stream flows return to pre-remedial action conditions. The hay bales/wattles will be affixed to the stream bottom and banks with wooden stakes. The hay bales and wattles will be removed along with other in stream devices that could be transported downstream prior to a significant storm event to avoid transport of these materials downstream.

The contingency plan for turbidity control will be to install additional rows of hay bales/wattles downstream of the excavation sites until the downstream turbidity is controlled within 29 NTU of background. The contingency plan for controlling turbidity associated with the pump discharge is to add additional length to the turbidity bag or additional sections of perforated pipe.

The contingency plan for controlling turbidity during storm events will be to cease operations and protect or close the excavation prior to the storm event. The limit i.e., face of the excavation will be covered with a geotextile fabric and the excavated area will be backfilled to cover the exposed tar containing sediments. Upon returning to the excavation site after a storm event, the backfill materials will be removed to expose the geotextile fabric to allow excavation to continue.

Additional contingency measures will include monitoring weather forecasts and weather radar on a daily basis to help avoid open excavation areas during continuous rain events. The

contingency plan for preventing pump operation problems is to keep an extra supply of geotextile wrap on hand to replace the fabric warp on the drum as needed and to remove any accumulated sediment from the isolating drum or replace the drum if needed. A back-up pump will be kept on-site in the event of pump failure. As an added contingency measure the water level on the upstream coffer dam will be managed not to exceed approximately ½ the height of the coffer dam.

The contingency plan for addressing a petroleum spill associated with the pumps, generators, or other on-site equipment will be to keep on hand petroleum absorbing materials to soak up the spilled material. Impacted soils will be excavated and containerized in accordance with appropriate petroleum cleanup regulations.

Tar Removal Locations & Property Ownership
Springstead and Hogtown Creeks
Gainesville, Florida

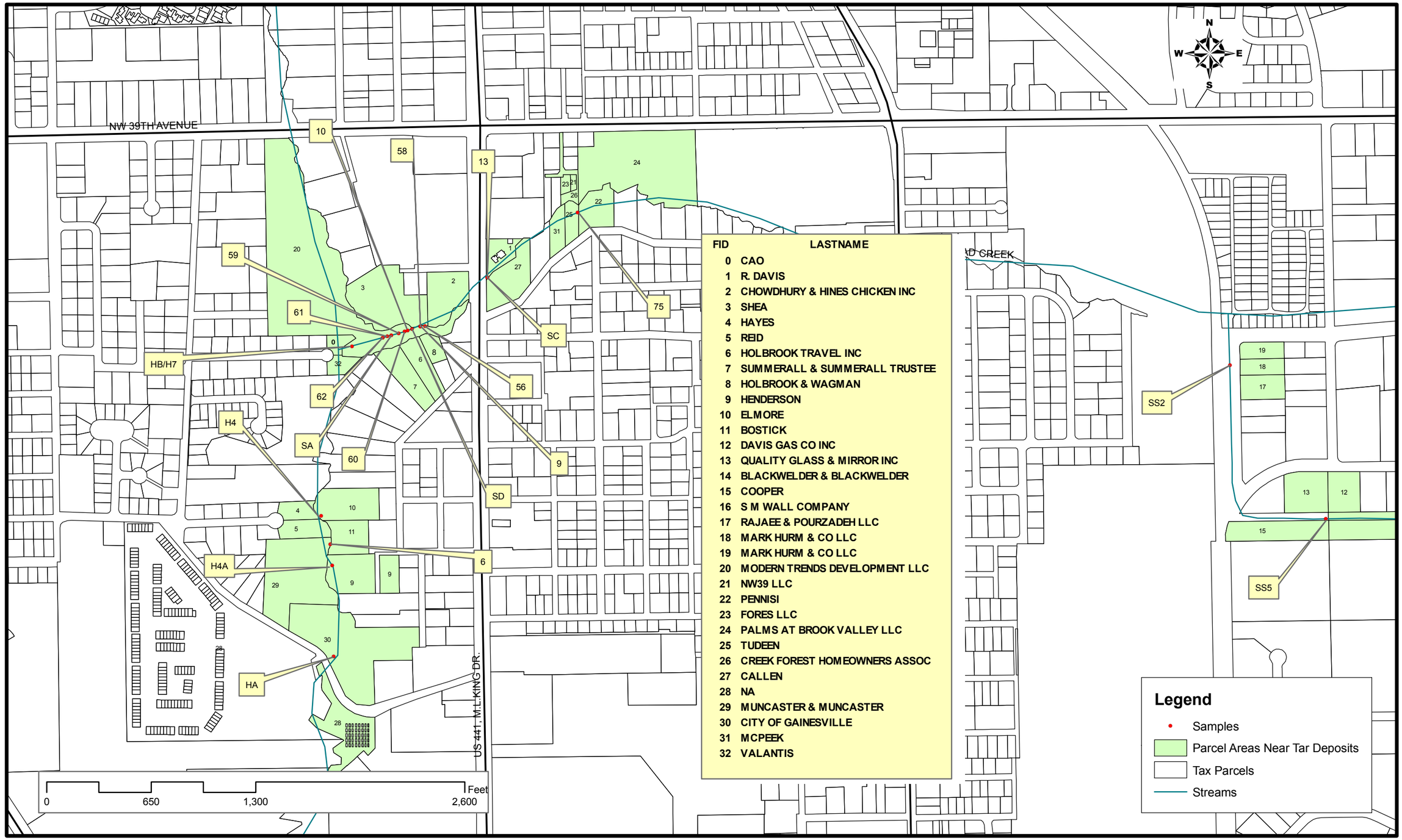


Figure 1.0

Gainesville, Florida

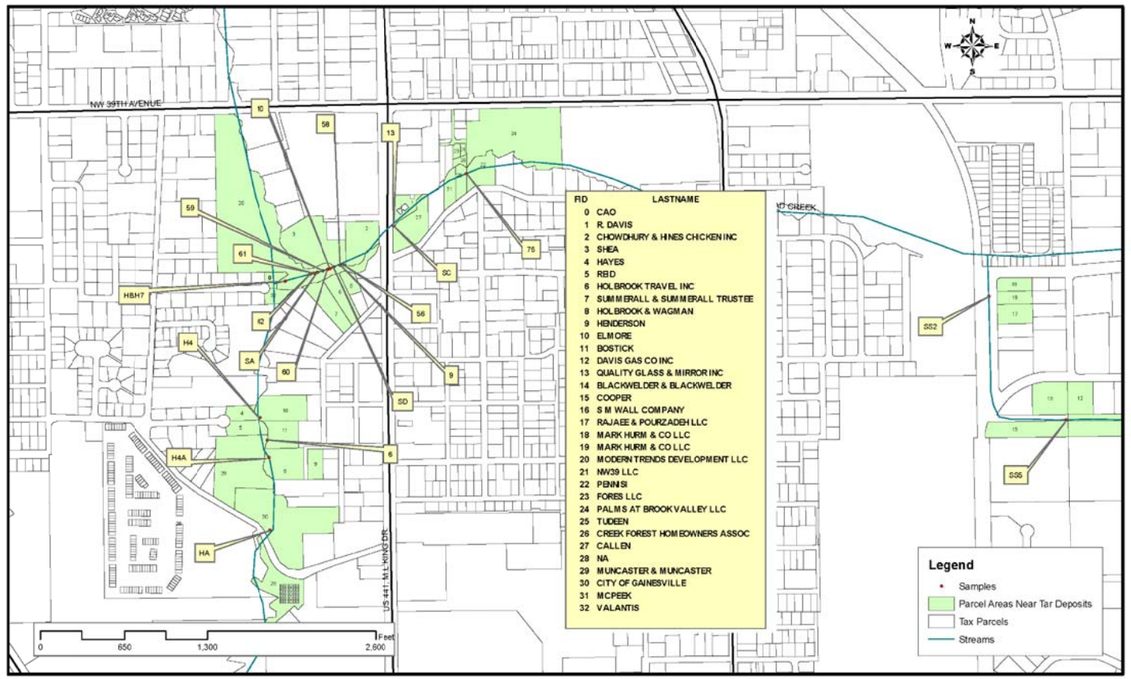
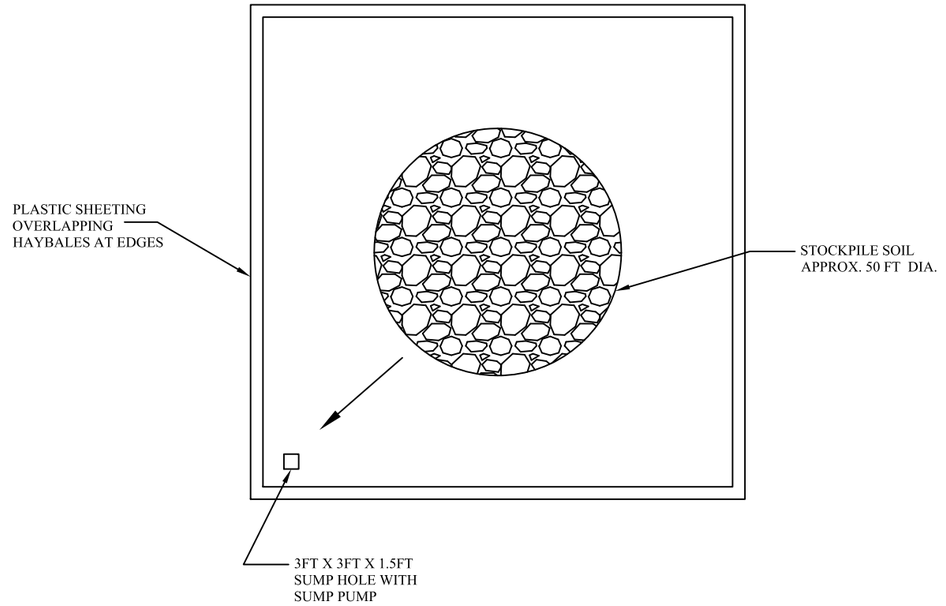
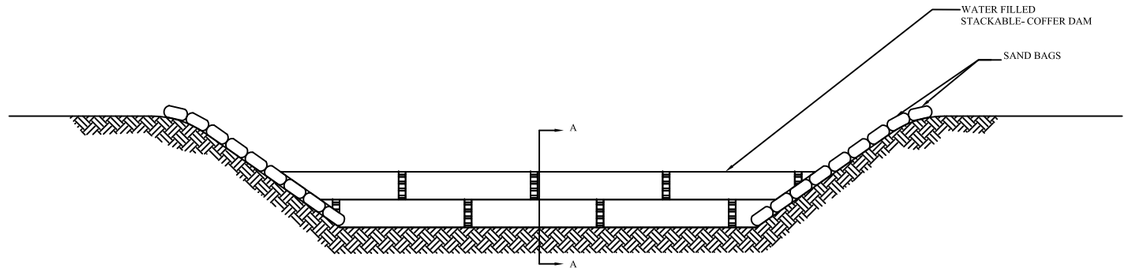
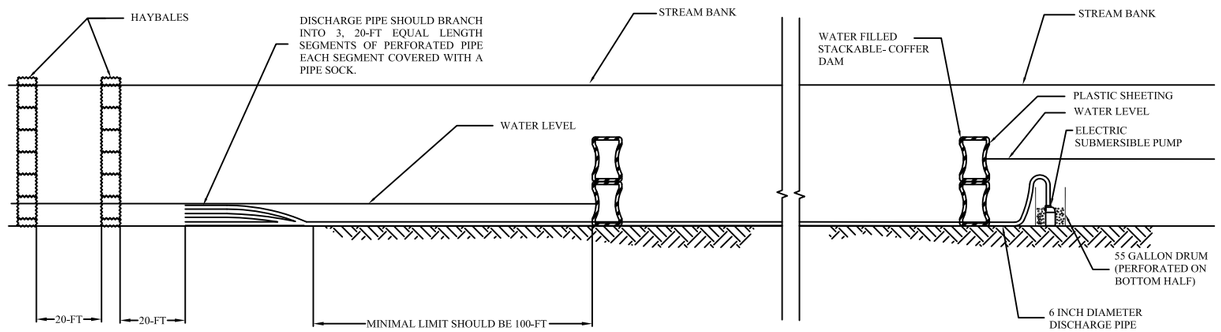


Figure 1.0







WESTON SOLUTIONS

APPR.	DATE	REVISION

PROJECT:
TAR REMOVAL
SPRINGSTEAD AND HOGTOWN CREEKS
GAINESVILLE, FLORIDA

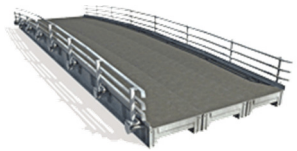
TITLE:
FIGURE 2 – WATER CONTROL AND STAGING AREA LAYOUT

SHEET: 1 OF 1

DRAWN:	DATE:	W.O. NO.:
P. BANNIS	12.02.10	05791.004.004.0012
CHKD BY:	DATE:	CAD NAME:
M. TAYLOR	12.02.10	CABOT DETAIL.DWG

ATTACHMENT 1
EQUIPMENT SELECTION

Process Flow for Soil Remediation



Evaluate Type of Access & Travel Distance

Pump Around & Coffer Dam
- Aqua Barrier
- Plastic Barrier
- Elec. Submersible Pump

Restricted/Limited
- Art. Dump Truck
- Tote Sacks
- Bridge Ramp
- Mats

Adjacent to Roadway
- Min-Excavator
- Telescoping Bucket
- Discharge to De-water Box

Transport to De-Watering Box Staging Area

Dewatering

Collected Water Management & T&D

Placement of De-watered Soils in Primary Staging Area

Stockpiling for T&D

Load Out & T&D of Tar Soils

Equipment Selection and Application

Cat 308:

- Use to Dump Totes into De-watering Box
- Use to excavate directly into Lull Bucket

(e.g. SS5)

- Use to Load out Stockpile Soils
- Used to Clear and Grub large Trees
- Longer Reach (dig-13ft; Ground Reach-20ft)
- Greater Lifting Capacity (4,000lbs-8,000lbs)
- Ground Pressure (0.41 kg/cm²)

Cat 301:

- Limited Lifting Capacity (1,700lbs Vs 8,000lbs)
- Lower Ground Pressure (~.08 kg/cm²)
- Smaller Width than Cat 308 (3'3" Vs 7'7")
- Use in creek where width is narrow.
- Use to excavate Creek Soils
- Can be Lifted into Creek Bed w/Lull

Water Filled Stackable-Coffer Dam

- Can be stacked.
- Can be manually placed
- Can be cabled together
- May be used to isolate a small area

Auqa Barrier-Coffer Dam

- Used to block larger area
- Will conform to bottom
- Requires less liner and sand bags
- Can be carried to a remote area.
- Pre-sized and not adjustable for small widths.

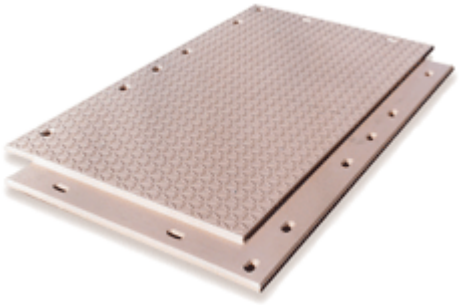
GSP30HV 6-Inch Submersible Pump w/Generator

- Able to handle a varying flow rate
- Can be manually placed (Weighs ~350lbs)
- Capable of 1,500gpm flow rates at 5ft TDH

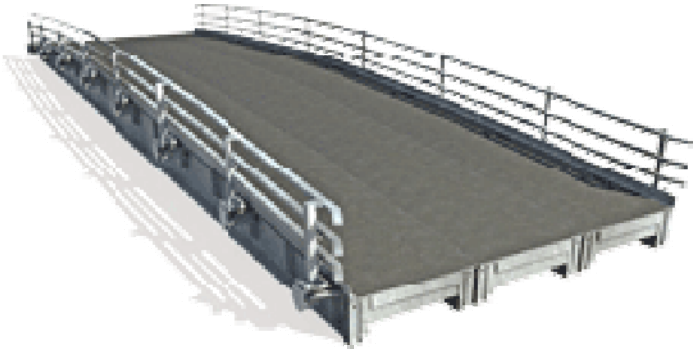
8”x6” Dri Prime

- Can be placed by Mini-Excavator
- Can handle high flow rates (>2,300gpm)
- Must be place w/mini-excavator

Mabey Bridge & Mats



- HDPE Construction
- Interlocking Key holds mats together on slopes
- Easily placed and relocated by Mini-excavator



- Bridge is sectional and can be assembled w/minimal use of min-excavator
- Can be placed on steep slopes in lieu of road construcion.
- Can be used to span Creek as needed.

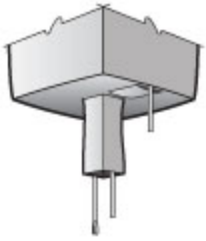
Standard Discharge Spout
(Duffel Cover Over Spout)

Flat Bottom

Full Open Dump

Cone Bottom

Sling Bottom



R.O.D.
Remote Open Discharge

<u>Super Sacks</u>

- Options include free standing opening
- Bottom Dump
- Lifitng Straps w/Stevadore Grab handles
- Liners
- Reusable
- Holds up to 1-ton

Soil Loading and Transport w/Track Art. Dump Truck & Versahandler

- Unit is track and can climb steep Grades
- Unit roates on chasis and does not require turnaround space
- Can Carry two Tote Sacks at a time
- Can be lined as double liner for tote leak contingency

- Telesocping boom can access creek bed from above.
- All Wheel Turning System allows for tight space configuration
- Can be used as a crane to place small mini-excavator directly into Creek bed.
- Can be used to direct load soils into bucket for direct discharge into de-watering box.

Dewatering and Water Handling

- Gravity Dewatering or Vaccum Asssist
- Sealed gate and Top Loaded
- Can be moved by Rail Truck or Mini-Excavator.
- Can add geo-textile for better solids filtration.

6,500 gl Baker Tank for Water Storage

- Can be used to transport water to tank storage area,
- Can be used to accelerate de-watering from de-watering box using vaccum assist.
- Can be used to collect sheen from creek, if needed.
- Can be used to vaccum soils from small areas w/access.

Stockpile Management and Loadout

Stockpile Management and Dumping when Cat 308 is in use.

Truck Loadout w/Cat 308

Use of Tandem or Tri-axles for Transport ot Landfill