Settlement monitoring was conducted during cap construction and monitored during and after construction.

Based on these assessments, cap thickness in Areas 1 and 2 is 1.5 feet to 3 feet or more, and in Area 8 is 2 to 4 feet thick, and achieve a minimum thickness of 18 inches following settlement, and is consistent with the approved design. Geotextile and geogrid have been placed below the capping material, providing further protection. In Areas 3, 7, and the 100 x 100 foot area, thicknesses of sand and/or topsoil achieved a minimum thickness of 14.7, 18.2, and 17.2 inches, respectively, consistent with the approved design. Consistent with the performance standard, it provides an adequate barrier to bioturbation which is not expected to exceed 10 cm (JCO, 2005c).

The bathymetric survey indicates that a minimum water depth has been maintained by the weir to prevent erosion and scouring. The bathymetric survey indicated that erosion and scouring of the subaqueous cap has not occurred (JCO, 2005c).

Subaqueous cap video inspections were conducted in 2003 to assess the condition of the subaqueous cap (JCO, 2005c). Due to the turbidity of the canal water and subsequent limited visibility, it was concluded to be impractical to provide complete video coverage of the cap (JCO, 2004a).

Chemical Monitoring. Seepage meters were installed in the subaqueous cap area (Areas 1, 2, and 8) for the purpose of monitoring groundwater flux and interstitial water quality in the cap in 2003. Monitoring efforts concluded that insufficient groundwater flux through the cap exists to allow chemical analysis of interstitial groundwater (JCO, 2005c).

Constructed cap core sampling and analysis was conducted with laboratory chemical analysis performed on the surface (0-10 cm) and mid-cap (30-40 cm) strata. Samples were analyzed for PAHs by EPA Method 8270, for metals by EPA Method 6010, and physical parameters. Constructed cap core sampling was conducted in 2003 in randomly selected locations from the subaqueous cap (Areas 1, 2 and 8) and Areas 3 and 7. Concentrations of metals and PAHs were below benchmark values in both mid-cap and top-cap samples (JCO, 2004a).

Cap core sampling and analysis was conducted in 2004 from twelve locations in Areas 1, 2, 3, and 8. Concentrations of PAHs exceeded sediment benchmark values in one mid-cap sample (resulting in the Area 2 average also exceeding the benchmark) and two top-cap samples. The two top-cap samples were located at T10+00 E20 in Area 1, and T12+00 E80 in Area 2. The elevated PAH findings in the two top-cap samples were attributed to their proximity to NAPL releases adjacent to the west bank cap (discussed below in section 6.3.2) although there was no visual evidence of NAPL noted in the sample (JCO, 2005c). Based on resampling in 2005, the mid-cap result was attributed to a NAPL layer resulting from a seep during construction which was later covered by capping material. It is therefore considered a relict of construction rather than migration through the cap.

Constructed cap core sampling and analysis was conducted in 2005 in twelve locations in Areas 1, 2, 3, and 8 as well as four additional locations between T9 and T13 (JCO, 2006a). Concentrations of PAHs exceeded benchmark values in one top-cap sample at T11+00 E40 in Area 2 and was attributed to the NAPL droplets reported on the top of the core.

Core sampling and analysis was conducted in 2005 in the natural cap Areas 4 and 5, with laboratory chemical analysis performed on the surface (0-10 cm) stratum. Samples were analyzed for PAHs by EPA Method 8270, for metals by EPA Method 6010, and physical parameters. Concentrations of PAHs exceeded benchmark values in three of the four top-cap samples and metals exceeded benchmark values in one of the top-cap samples. The performance standard for the capped areas is not applicable to this area.

Cap Compliance Monitoring Summary. Across much of the Site, compliance monitoring data collected to date indicates that the cap has met the performance standards in that it contains and isolates the contaminated sediment and is resistant to erosion or bioturbation that would expose contamination, with the following qualifications:

Cap interstitial water has not been directly assessed as seepage collection devices did not collect sufficient water to analyze. Modeling and seepage meter tests indicate that upward flow of groundwater through the cap is negligible and that recontamination of the cap via contaminated groundwater would be insignificant. Surface water monitoring results also indicate that there is no significant contaminated groundwater migration through the cap. It is possible, however, that benthic organisms may be exposed to contaminated cap interstitial water if it exists.

Some top-cap core samples taken from Areas 1 and 2 exceed ecologically-protective sediment benchmarks for PAHs. Elevated PAHs are attributed to NAPL droplets observed in the sample or, in those instances were NAPL droplets were not observed in the sample, the proximity of the sample to the area of NAPL releases. Free-phase coal tar (NAPL) continues to seep through discrete channels in the subaqueous cap in the southern portion of the Site, and is being deposited on the water and cap surface. This is discussed further in the following section of this report.

6.3.2 Review of NAPL Release Data

The ROD did not envision that contamination in the form of free-phase NAPL would migrate through the cap. Therefore, there is not a cap performance standard specifically addressing NAPL or NAPL migration mechanisms. However, NAPL is a component of the performance standard that requires isolation of sediment contamination from benthic organisms and fish.

Following completion of the cap and subsequent re-flooding of the canal in spring of 2003, NAPL releases appeared on the water and cap surface in the southern portion of the Site (JCO, 2004b). Releases were initially associated with the west cribbing wall on the west bank of the canal and west of the capped area and were identified between T11+20 and T9+75 and between T10+50 and T11+30. Extensive monitoring has continued since that time to assess the nature and extent of the releases and the migration mechanism(s) and consist of the following efforts. The extent of NAPL releases observed prior to field investigations conducted in 2006 is shown on Figure 9.

Winter 2003-2004: Assessment of NAPL location and thickness on the cap by swabbing with a sorbent pad. NAPL thicknesses of more than a foot were observed in some locations (JCO, 2005c).

Summer/Fall 2004: Residual NAPL was vacuumed and swabbed from the canal cap surface. Residual NAPL was also removed from the ground surface west of the canal. Four NAPL recovery wells were

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