



Hercules Incorporated  
Hercules Research Center  
500 Hercules Road  
Wilmington, DE 19808-1599  
Writer's Direct Dial: 302-995-3433

March 1, 2013

Mr. Patrick Hseigh  
Hazardous Substances Engineer  
Department of Toxic Substances Control  
700 Heinz Avenue, Suite 200  
Berkeley, 94710-2721

**2012 FIVE-YEAR REMEDIAL ACTION REVIEW REPORT FOR THE HERCULES  
INCORPORATED WETLANDS AREA, LOCATED IN HERCULES, CALIFORNIA**

Dear Mr. Hseigh:

Attached you will find the above-referenced report which has been prepared for Hercules Incorporated by Cameron-Cole. The report presents the results of the five-year review for the wetlands area at the former Hercules Incorporate Site. This report has been prepared and is submitted in accordance with Section 3.3 of the operation and maintenance agreement (Docket No. HAS 92/93-002).

If you have any questions, please do not hesitate to contact me at (302) 995-3433.

Sincerely,

A handwritten signature in black ink, appearing to read "Ed Meeks". The signature is written in a cursive, flowing style.

Edward Meeks  
Remediation Project Manager

cc: Ms. Barbara J. Cook (DTSC)  
Mr. Michael Buelna (Fish & Game)  
Mr. Michael Whitsel (RWQCB)  
Ms. Carin High (US Army Corps of Engineers)  
Mr. Michael Dever (Ashland)  
Mr. Chris Walsh (Cameron-Cole)



**FOURTH FIVE-YEAR REVIEW REPORT  
HERCULES INCORPORATED SITE  
HERCULES, CALIFORNIA**

**FEBRUARY 2013**

Prepared For:

Hercules Incorporated  
Wilmington, Delaware

Prepared By:

Cameron-Cole, LLC  
Oakland, California

Prepared by:

A handwritten signature in blue ink, appearing to read 'Chris Walsh'.

Chris Walsh  
Senior Hydrogeologist

Reviewed by:

A handwritten signature in blue ink, appearing to read 'Brad Wright'.

Brad Wright, PG, CHG  
Principal Geologist



creating sustainable success

50 Hegenberger Loop, Oakland, CA 94621 P. 510.777.1870 F. 510.777.1871

[www.cameron-cole.com](http://www.cameron-cole.com)



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## **1.0 INTRODUCTION**

This report presents the fourth five-year performance review for the approved remedial alternative for the Wetlands Area at the former Hercules Incorporated Site (Site). The Site is located in the vicinity of San Pablo Avenue and Sycamore Avenue within the City of Hercules, California (see Figure 1). This five-year review was conducted by Cameron-Cole, LLC (Cameron-Cole) pursuant to the requirements of Section 3.3 of the Agreement, Operation and Maintenance of the Wetlands Area, Docket No. HSA 92/93-002, issued by the Department of Toxic Substance Control (DTSC) to Hercules Incorporated (HI) on October 19, 1992. The purpose of this review is to ensure that the remedial actions that were implemented continue to remain protective of public health and the environment and that the remedy is functioning as designed.

The approved remedial alternative for the Wetlands Area included removal of nitroaromatic compounds from selected “hot spots”, restoration of the wetlands to their original function and value, placement of a deed restriction and performance of five-year reviews. This approval was based on the fact the low level concentrations of certain nitroaromatic compounds were left in place following remediation of the Wetlands Area.

The remainder of this section presents a background discussion of the Site. The remainder of the report is divided into the following sections:

- Section 2.0 Summary of Remedial Actions
- Section 3.0 Five-Year Review Process
- Section 4.0 2012 Five-Year Review Findings
- Section 5.0 Technical Assessment of Protectiveness Summary
- Section 6.0 Conclusions
- Section 7.0 Next Five-Year Review

### **1.1 BACKGROUND**

Background information presented in this section was largely obtained from the Covenant and Agreement to Restrict Use of the Property (the Covenant), which was issued by the DTSC on September 21, 1992. The background discussion therein was most recently updated in the third five-year review report that was prepared on behalf of Hercules Incorporated by Questa Engineering Corporation (Questa) in 2007. Cameron-Cole recently completed the fourth five-year review of the Wetlands Area and determined that no significant changes from prior background discussions were evident. However, for informational purposes, the background information for the Wetlands Area is revisited herein and, in some cases, is updated based on our observations of the current conditions at the Site.

The Wetlands Area that is subject to this review is part of a 41-acre site located within the City of Hercules, County of Contra Costa, California. The 41-acre site (shown on

Figure 1) is an area where former Hercules Powder Company Plant operations resulted in runoff of contaminated washwater containing site related contaminants from adjacent bunker operations. According to previous documentation, this contaminated washwater drained into the Wetlands Area and resulted in site related constituents entering the subsurface soil. As indicated, the Wetlands Area comprises a small portion of the overall site (approximately 2-acres). An aerial photograph of the Wetlands Area is shown on Figure 2. The remaining 39-acres referred to in the Covenant as the upland area, were remediated separate from the Wetlands Area, which is the sole focus of this fourth five-year review.

According to the Covenant, "Wetlands" shall mean lands which may be covered periodically or permanently with shallow water and which may include saltwater marshes, freshwater marshes, open or closed brackish water marshes, swamps, mudflats, fens and vernal pools. As defined by Questa, the subject Wetlands Area is a freshwater cattail marsh that serves primarily as a wildlife habitat. Current five-year review observations confirm this definition. A surveillance of the area indicated that access to the area is extremely restricted due to the presence of dense blackberry and cattail thickets. Our surveillance also revealed that a small, willow-lined creek flows from south to north through the area into the cattail marsh. At the time of our visit, water was actively flowing through the area. Consistent with previous reports, the cattail marsh area is dammed at the northern boundary by a berm that is transited by a paved bike path. However, water was observed to be flowing below and beyond the bike path into three, large diameter, corrugated plastic culverts that transit beneath Sycamore Avenue. These culverts allow for the passage of water from the Wetlands Area to a larger wetlands area on the northern side of Sycamore Avenue. Photographs of these culverts are included in Appendix A.

Consistent with previous observations, the surrounding areas have been largely developed as residential neighborhoods. These neighborhoods are evident on the aerial photograph presented on Figure 2. The maintained lawn area that was described in the previous five-year report as being adjacent to the southwest corner was actually observed adjacent to the northwest corner. The southwest corner was observed to be largely wooded. The fence that was installed during the wetlands remediation to protect the new plants is largely overgrown.

According to Covenant, shallow subsurface soil at the Site was found to contain residual trinitrotoluene (TNT), dinitrotoluene (DNT) and dinitrobenzene (DNB). These constituents in the upland areas were excavated to meet residential standards and disposed offsite in March and April 1992. In the Wetlands Area, the excavation focused on "hot spots" and some soils containing low concentrations of nitroaromatic compounds were left in place. Based on the continued presence of these low concentrations, a deed restriction was filed with the Contra Costa County Recorder's Office (the Covenant) and five-year reviews are required.

Three five-year reviews were previously completed by Questa Engineering Corporation (December 1997, October 2002 and October 2007). During the first two five-year

reviews, soil and water sampling was conducted and the results were interpreted to confirm that only low level concentrations of nitroaromatic compounds remained in the Wetlands Area. The third five-year review did not involve sampling but was conducted to verify that the current land use was consistent with the institutional controls specified in Article III of the Covenant. The results of the third five-year review confirmed that the current land uses were consistent with the Covenant and, as such, it was concluded that no risks to public health or the environment were evident. This fourth five-year review was also conducted to confirm that current land uses are consistent with the Covenant.

## **2.0 SUMMARY OF REMEDIAL ACTIONS**

According to Questa and information obtained from the DTSC Envirostor database, remediation of the Wetlands Area consisted of temporary removal of approximately 16-inches of topsoil from the Wetlands Area, excavation of “hot spots” of nitroaromatic-contaminated soil from 16 to 28-inches below the wetlands and off-site disposal of the excavated sediments. Confirmatory soil samples were collected to verify cleanup and surface water samples were collected downstream of the Wetlands Area to verify that no off-site migration of site related constituents had occurred. Following cleanup, the area was backfilled with clean fill and the topsoil that had been removed prior to the remedial work. The disturbed areas of the wetlands were then replanted and seeded with native plant species and a fence was installed around the Wetlands Area to protect the new plants. A deed restriction was filed with the Contra Costa County Recorder to ensure wetlands preservation.

Based on the results of the first three five-year reviews, it was concluded that the remedy had functioned as intended. The results of the reviews were deemed to indicate that no changes have occurred at the Site that indicate disturbance of the wetland or site soils and no increase in human health risk or environmental damage was evident.

### **3.0 FIVE-YEAR REVIEW PROCESS**

The 2012 five-year review process was initiated in November 2012 and included a site walk to inspect current conditions and to verify that there are no unauthorized site uses. To document changes since the previous five-year review, photographs were taken at approximately the same locations as those taken during the 2007 five-year review. These photographs (Photo 1 through 7) are included in Appendix A. Photos 8 through 13 are additional photos that show other Site features that have been or will be mentioned throughout this report. The 2012 five-year review process also included inquiries to the City of Hercules and Contra Costa County. The purpose of these inquiries was to verify that the deed restrictions are still in place and to verify that any proposed development of land use changes are in compliance with the Covenant. The results of the 2012 five-year review are presented in Section 4.0.



#### **4.0 2012 FIVE-YEAR REVIEW FINDINGS**

As discussed in Section 2.0, some soils containing low concentrations of nitroaromatic compounds were left in place in the Wetlands Area. Based on the continued presence of these low concentrations, a deed restriction was filed with the Contra Costa County Recorder's Office (the Covenant). The deed restriction prohibits the development and use of the Wetlands Area for any purpose other than the preservation of the wetlands. The DTSC's purpose in requiring this restriction was to eliminate any significant risks to human health and the environment associated with remaining site related constituents in soil.

The conditions of the deed restriction for the Wetlands Area include, but are not limited to:

- No development of the Wetlands for commercial, industrial, research and development, office, warehouse, or any other business or occupational use shall be permitted. Any disturbance shall not be permitted on the Wetlands unless otherwise necessary to mitigate the contaminants left on the Wetlands.
- No agricultural use shall be permitted on the Wetlands.
- No residence, hospitals, day-care centers, schools, senior citizen centers, or other permanently occupied human habitation shall be permitted on the Wetland.
- No disturbance of the soils/sediments and surface water on the Wetlands shall be permitted. Such prohibited activities on the Wetlands include: excavation, grading, removal, trenching, filling, mining, or drilling of gas, oil or water wells.
- The Wetlands shall not be subdivided except as allowed pursuant to Section 25232(a)(2) of the Health and Safety Code.
- The vegetation, surface water and habitat of the Wetlands shall be preserved to the extent feasible as set forth in the Department approved Operation and Maintenance Plan dated August 1992. The use of the Wetlands shall be dedicated solely to the Wetlands habitat.
- The DTSC or its designated agents shall have access to the Wetlands.

A complete listing of restrictions can be found in the Covenant. Certain restrictions only applied to the first three years of the Covenant.

On behalf of Hercules Incorporated (HI), Cameron-Cole conducted a site reconnaissance of the Wetlands Area on October 31, 2012 to assess whether these conditions have been satisfied and to ensure that current and future site uses are consistent with the deed restrictions. Photographs depicting current conditions of the Wetlands Area are included in Appendix A. The following observations were made.

- No development of the Wetlands of any kind was observed.
- There was no evidence of agricultural use.
- Disturbance of Site soils was not apparent in the Wetlands Area.
- The Wetlands area has not been subdivided.
- The vegetation in the Wetlands is dense and robust, and there was no evidence of distressed vegetation.
- Surface water flow through the Wetlands Area was active during the Site visit.
- Songbird and waterfowl activity was active.
- No evidence of human activity was observed within the wetlands; there were no footpaths, homeless encampments or graffiti observed and litter was at a minimum.
- Due to the dense vegetation, particularly the blackberry bushes, access to the Site is extremely limited.

In addition, the following agency information was obtained.

- A file review at the Contra Costa County Recorder's office confirmed that the Covenant and Agreement to Restrict Use of Property at the Hercules Incorporated Wetlands Area is still on file and in effect.
- According to the Contra Costa County Department of Conservation and Development, there have been no requests for permit applications or submittals of any development plans for the Wetlands Area.
- According to the City of Hercules, there have been no requests for permit applications or submittals of any development plans for the Wetlands Area.
- Review of the DTSC Envirostor database indicates that the Covenant and Agreement to Restrict Use of Property at the Hercules Incorporated Wetlands Area is still on file and in effect.

Based on this information, it appears that the Wetlands Area is in compliance with the conditions of the deed restriction and that the current non-use of the Site is consistent with the remedial goals. HI has no plans to use the Wetlands Area for any future development and is satisfied with the deed restriction as an acceptable remedial alternative.

## **5.0 TECHNICAL ASSESSMENT OF PROTECTIVENESS SUMMARY**

The assessment of protectiveness is provided to evaluate whether the final remedy implemented at the Site is protective of human health and the environment.

As discussed in Section 1.0, the final remedy for the Wetlands Area consisted of excavating “hot spots” of nitroaromatic constituents contained in soil from 16 to 28-inches below the wetlands and off-site disposal. Some soils containing low concentrations of nitroaromatic compounds were left in place. Based on the continued presence of these low concentrations, a deed restriction was filed with the Contra Costa County Recorder’s Office (the Covenant) and five-year reviews are required. Because the institutional control continues in the form of the deed restriction, the remedy is functioning as intended in the final Amended Remedial Action Plan, dated January 1992, and the assumptions used for selection of the final remedy are still valid. Further, no change in land-use or new contaminants or contaminant sources of site related constituents have been identified which question the protectiveness of the final remedy. As such, the remedy at the Wetlands Area is protective of human health and the environment and exposure pathways that could result in unacceptable risks are being controlled. Because the remedial actions at the Wetlands Area are protective, the Site is protective of human health and the environment.

## **6.0 CONCLUSIONS**

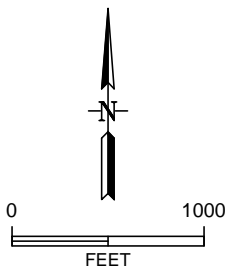
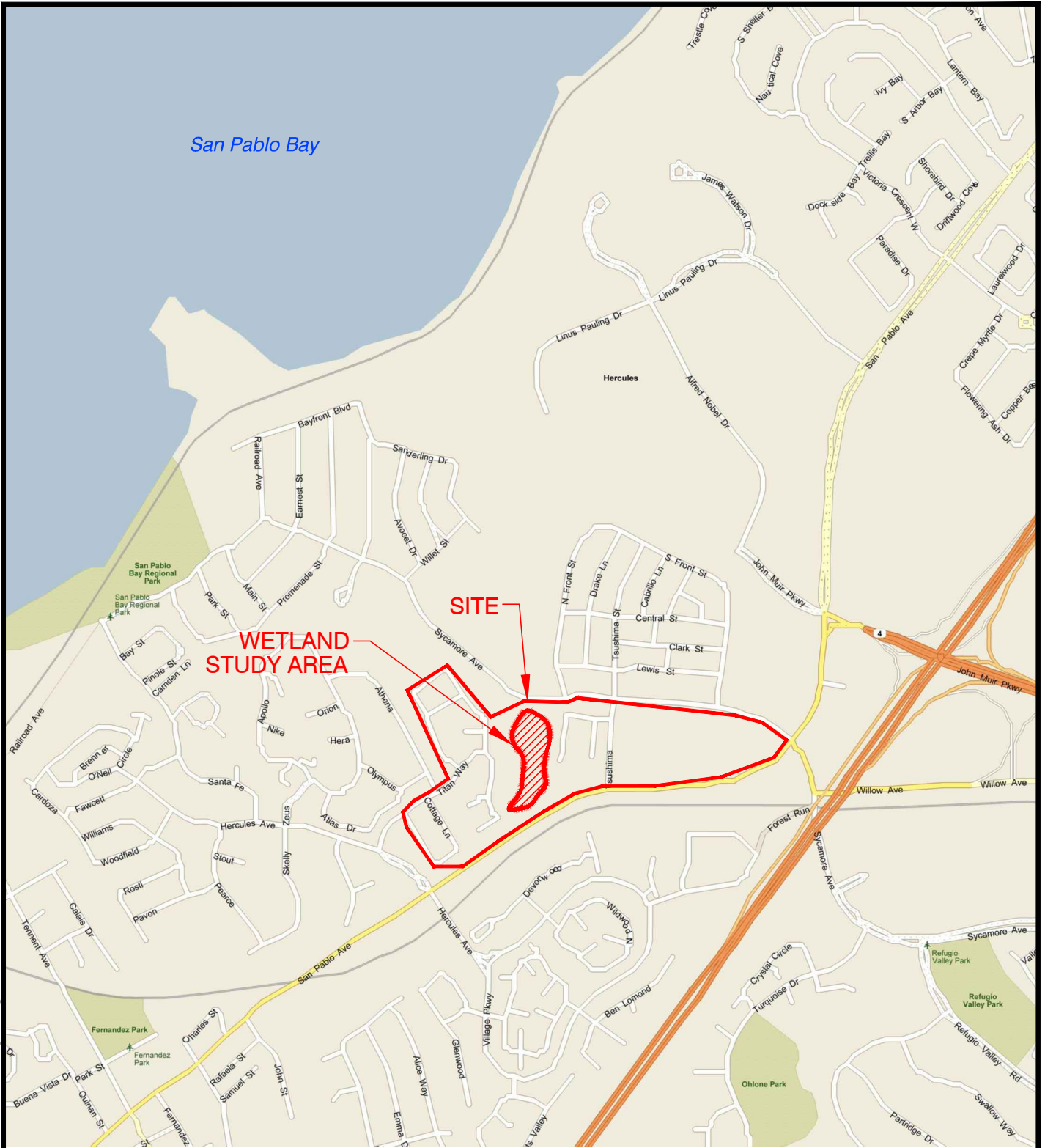
- The Wetlands Area appears to be very healthy and vibrant, with robust vegetation and active wildlife.
- No development of any kind was observed and there was no evidence of agricultural uses or disturbance of Site soils.
- No evidence of human activity was observed; there were no footpaths, homeless encampments or graffiti observed and litter was at a minimum.
- The Site reconnaissance provided comprehensive evidence that the conditions of the deed restrictions continue to be attained.
- Review of agency files indicates that the Covenant is on file and in effect.
- Current Site uses are consistent with the intended remedial goals. Because the remedial actions are protective, the Site is protective of human health and the environment.

## **7.0 NEXT FIVE-YEAR REVIEW**

Based on the results of the wetlands investigation described above and the evident success of the wetlands restoration, it does not appear that continued five-year reviews are necessary. However, HI understands that in accordance with Section 121(c) of CERCLA, five-year reviews must be conducted unless the low concentrations of nitroaromatic compounds are removed or have decayed to residential standards. To verify the continued success of the Wetlands Area remediation, HI will the next five-year review in November 2017.

## FIGURES

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**Cameron-Cole**

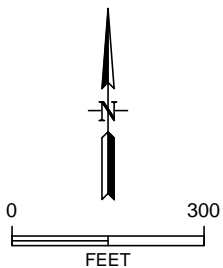
50 HEGENBERGER LOOP  
 OAKLAND, CALIFORNIA 94621  
 PHONE: (510) 777-1870  
<http://www.cameron-cole.com>

**FIGURE 1**

**HERCULES INCORPORATED  
 WETLANDS STUDY AREA  
 HERCULES, CALIFORNIA**

SCALE: AS SHOWN	DATE: 1/14/13	PROJECT NO. 2022
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**Cameron-Cole**  
 50 HEGENBERGER LOOP  
 OAKLAND, CALIFORNIA 94621  
 PHONE: (510) 777-1870  
<http://www.cameron-cole.com>

**FIGURE 2**

**HERCULES INCORPORATED  
 WETLANDS STUDY AREA  
 HERCULES, CALIFORNIA**

SCALE: AS SHOWN	DATE: 1/14/13	PROJECT NO. 2022
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**APPENDIX A**  
**SITE PHOTOGRAPHS**



**PHOTO 1**

**LOOKING NORTHWEST TOWARD SYCAMORE AVENUE**



**PHOTO 2**

**LOOKING NORTH TOWARD SYCAMORE AVENUE**



**PHOTO 3**

**LOOKING SOUTHWEST**



**PHOTO 4**  
**LOOKING WEST**



**PHOTO 5**  
**LOOKING NORTHEAST**



**PHOTO 6**  
**LOOKING EAST**



**PHOTO 7**  
**LOOKING SOUTHEAST**





**PHOTO 8**

**CATTAIL THICKET**



**PHOTO 9**

**DRAINAGE CULVERT – SOUTH OF SYCAMORE AVENUE**



**PHOTO 10**

**DRAINAGE CULVERT – NORTH SIDE OF SYCAMORE AVENUE**



**PHOTO 11**

**WETLANDS AREA NORTH OF SYCAMORE AVENUE**



**PHOTO 12**

**BIKE PATH – NORTH SIDE OF WETLANDS**



**PHOTO 13**

**MAINTAINED LAWN AREA – NORTHWEST OF WETLANDS**