WATERSTONE ENVIRONMENTAL, LLC
Clifton W. Davenport, *Principal Geohydrologist*
2712 Rawson Street* Oakland, CA 94619
510-533-6710 * Fax: 510-533-7501
E:Mail: cdavenport@msn.com

April 2, 1999

Ms Susan Hugo
Alameda County Department of Environmental Health
1131 Harbor Bay Parkway
Suite 250
Alameda, CA 94502-6577

Dear Ms Hugo:

RE: TRANSMITTAL OF EXECUTIVE SUMMARY FOR THE HUMAN HEALTH TIER 2 RISK ASSESSMENT, FORMER BERKELY FARMS PROPERTY, 4575 SAN PABLO AVENUE, EMERYVILLE, CALIFORNIA

Included herein is the above-referenced document, as requested by the ACDEH and RWQCB. The document also includes a site-specific Conceptual Site Model diagram as a figure for the Executive Summary. Since there were no changes to the draft RBCA Tier 2 Risk Assessment previously submitted, I have enclosed title pages changed to reflect that the document is no longer considered "Draft".

Based on your verbal approval to me on April 1, 1999, Harmon Management Corporation plans to open the new Kentucky Fried Chicken Restaurant on Saturday, April 3, 1999. Accordingly, we would appreciate receipt of your written acceptance of the final document at your earliest convenience

Thank you again for all your assistance throughout the various phases of the project. If you have any questions on this matter, please contact me at the numbers listed above.

Sincerely,

Clifton Davenport, CEG/CH
Principal Geohydrologist

Cc: Karen Bellini

S:KFC\HRA XS TRANSMITTAL

EXECUTIVE SUMMARY

This Human Health Risk Assessment (HRA) evaluates the potential impact to commercial and construction workers at the property (Property) located at 4575 San Pablo Avenue, Emeryville, California. Until recently, Berkeley Farms, who operated a truck repair and storage facility since the early 1980's, owned the Property. A service station was operated by several entities on the southern portion of the property from the early-mid 1960's through 1985. In late 1998, Harmon Management Corporation (HMC) purchased the Property with the intent to construct a fast-food restaurant on the southern portion of the Property, in accordance with local zoning. Berkeley Farms conducted soil and groundwater remediation in the vicinity of the former underground storage tanks (USTs) and reported excavation sidewalls as not containing residual concentrations of gasoline or related petroleum hydrocarbons. Due to the elevated concentrations of such compounds in groundwater, the Alameda County Department of Environmental health required that a Risk Management Plan (RMP)(recorded November 30, 1998) include preparation of a "Risk-Based corrective Action (RBCA) Tier 1 or equivalent risk evaluation [to] ensure that concentrations of such compounds in indoor air are below exposure guidelines."

The initial Tier 1 screening of groundwater concentrations did not pass the RBCA guidelines (Table 1) so a Tier 2 evaluation was conducted. Due to the limited database available for water quality conditions beneath the Property, maximum concentrations were used in the risk evaluation process. Assumptions used in the transport modeling are listed on Table 4. The evaluation assumed the commercial worker was onsite for 250 days a year for 25 years, and that the only route of exposure was through inhalation of vapors. The construction worker scenario assumed that the worker would be onsite for 90 days in one year and routes of exposure included inhalation, dermal contact with and ingestion of soil, but no direct contact with groundwater. The estimated carcinogenic risk to commercial workers was well within the US EPA's guidelines for acceptable risk of 10^{-4} to 10^{-6}, while that estimated for construction workers was well below the threshold level of concern. The hazard quotient for both construction and commercial workers was well below 1.0, indicating that non-carcinogenic exposure was also not of concern.

Given this information, HMC finalized contractual issues and mobilized to the Property to begin construction of the fast-food restaurant. Waterstone Environmental was onsite to conduct precautionary air monitoring and to direct the stockpiling of impacted soils, if any, as required by the soil management plan submitted to the ACDEH as part of RMP compliance. During the initial trenching for utilities, numerous pipes associated with the former USTs were uncovered. Soil sampling indicated that contamination by gasoline-related petroleum hydrocarbons was extensively present beneath the building footprint.

While the HRA obviously needed to be modified to incorporate the additional contribution to indoor air and other routes of exposure associated with the soil contamination, construction workers were on standby time and it was not feasible to have them remain so until the HRA revision was completed. Accordingly, Berkeley Farms removed all soils beneath and immediately adjacent to the footprint to a depth of 45 inches (3.75 feet) below ground surface to ensure that construction workers would not be handling impacted soils. However, residual contamination was present below this depth, and so a 40-mil thick vapor barrier was laid down at the base of the excavation as described in Waterstone (1999). The excavation was then backfilled with clean soil and pipes for a backup vapor collection and exhaust system installed in the clean fill.

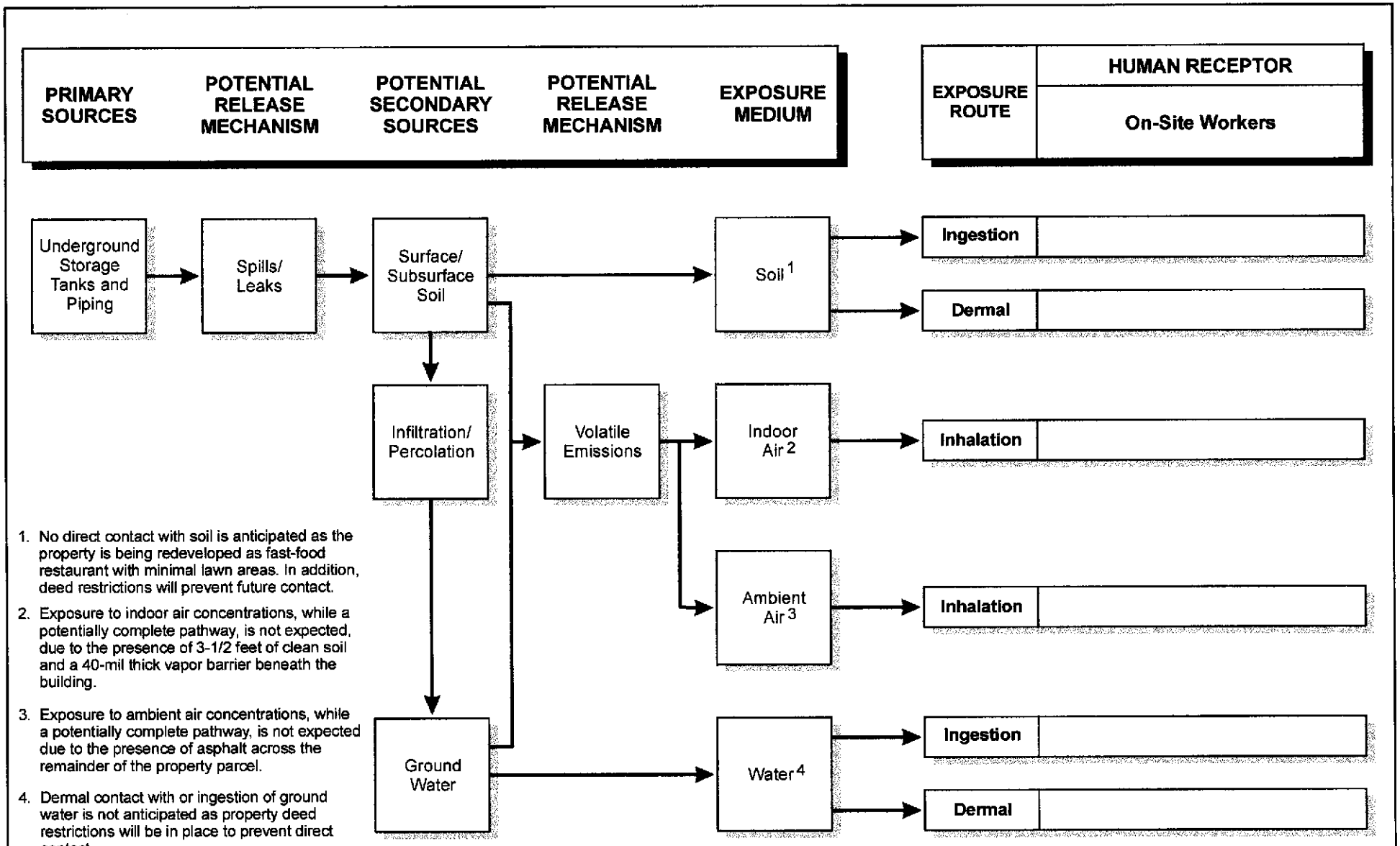
Since significant soil contamination was now known to exist at the Property, the HRA was modified to include contributions to the various routes of exposure from this medium.

Representative soil concentrations were first determined by selecting the 95th percentile Upper Confidence Level (UCL) around the arithmetic mean for each of the chemicals of concern (Table 2B). All samples collected during various assessments and remedial actions from soils at depths and locations still present at the Property were included in the evaluation. Indoor and ambient air concentrations from soil vapor (Tables 3A, 3B) were calculated and added to that arising from ground water (Tables 3C, 3D) to determine the total calculated concentrations of vapors arising from the subsurface (Table 6). The cancer and non-cancer risk calculations were modified to identify the new inhalation risk for commercial and construction workers, as well as include dermal contact with and potential ingestion of soil by construction workers (Tables 9 and 10, respectively) using the revised representative soil concentrations. The cumulative estimated cancer risk and noncancer hazard are summarized and presented in Table 11.

The total estimated incremental carcinogenic risk to construction workers was 4.93×10^{-8} while the calculated non-carcinogenic hazard indices were 0.03 and 0.04 for commercial and construction workers, respectively. These levels are all far below the US EPA's threshold levels of concern. However, the estimated incremental lifetime carcinogenic risk to commercial workers was 1.32×10^{-4}, which is outside the US EPA's range of acceptable risk (10-4 to 10-6). Therefore, the Tier 2 screening did not pass, assuming unabated conditions.

However, the remedial actions conducted at the Property create conditions for vapor migration much more restrictive than those used in the RBCA modeling. The presence of over three feet of clean soil beneath the building eliminates the dermal and ingestion routes of exposure, as well as the assumption of uniform distribution of chemicals beneath the building. The clean soil alone would act to retard vapor migration due to steady-state partitioning between the soil vapor and clean soil. The vapor barrier eliminated the crack fraction coefficient used in the modeling; more practically it prevents soil vapor from impacted soils below migrating into the building above the barrier. Finally, even if some fugitive vapors do make it past the vapor barrier and clean soils, the backup vapor collection and exhaust system will function to remove those vapors from the point of exposure. Accordingly, the indoor air exposure pathway is actually incomplete (Figure ES 1).

Even if commercial workers were to remain at the fast-food restaurant for 25 years (highly unlikely), the workers would not be exposed to the petroleum hydrocarbons at unacceptable risk levels. Workers should be able to enter and work in the building, and Proposition 65 warning signs are not warranted. It would be prudent to conduct some type of time-weighted air monitoring periodically within the building at appropriate times, to be determined in conjunction with the ACDEH.



Waterstone Environmental, LLC
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FIGURE ES 1
CONCEPTUAL SITE MODEL DIAGRAM
KENTUCKY FRIED CHICKEN RESTAURANT
4575 SAN PABLO AVENUE
EMERYVILLE, CALIFORNIA

HUMAN HEALTH RISK ASSESSMENT – FORMER BERKELEY FARMS PROPERTY

Located at
4575 San Pablo Avenue
Emeryville, California

April 2, 1999

Prepared for: **Harman Management Corporation**

Prepared by:

Waterstone Environmental, Inc
2712 Rawson Street
Oakland, California 94619

Proprietary Notice

The report and its contents represent PRIVILEGED AND CONFIDENTIAL INFORMATION. This document should not be duplicated or copied under any circumstances without the express permission of Harman Management Corporation. The purpose of the report is to allow Harman Management Corporation to evaluate the potential environmental liabilities at the Property. Any unauthorized reuse of Waterstone Environmental, Inc.'s reports or data will be at the unauthorized user's sole risk and liability.

HUMAN HEALTH RISK ASSESSMENT – FORMER BERKELEY FARMS PROPERTY

Located at
4575 San Pablo Avenue
Emeryville, California

April 2, 1999

Prepared by:

Jill Ryer-Powder, Ph.D. DABT
Principal, Health Sciences

Clifton W. Davenport, CEG/CH
Principal
Geohydrologist

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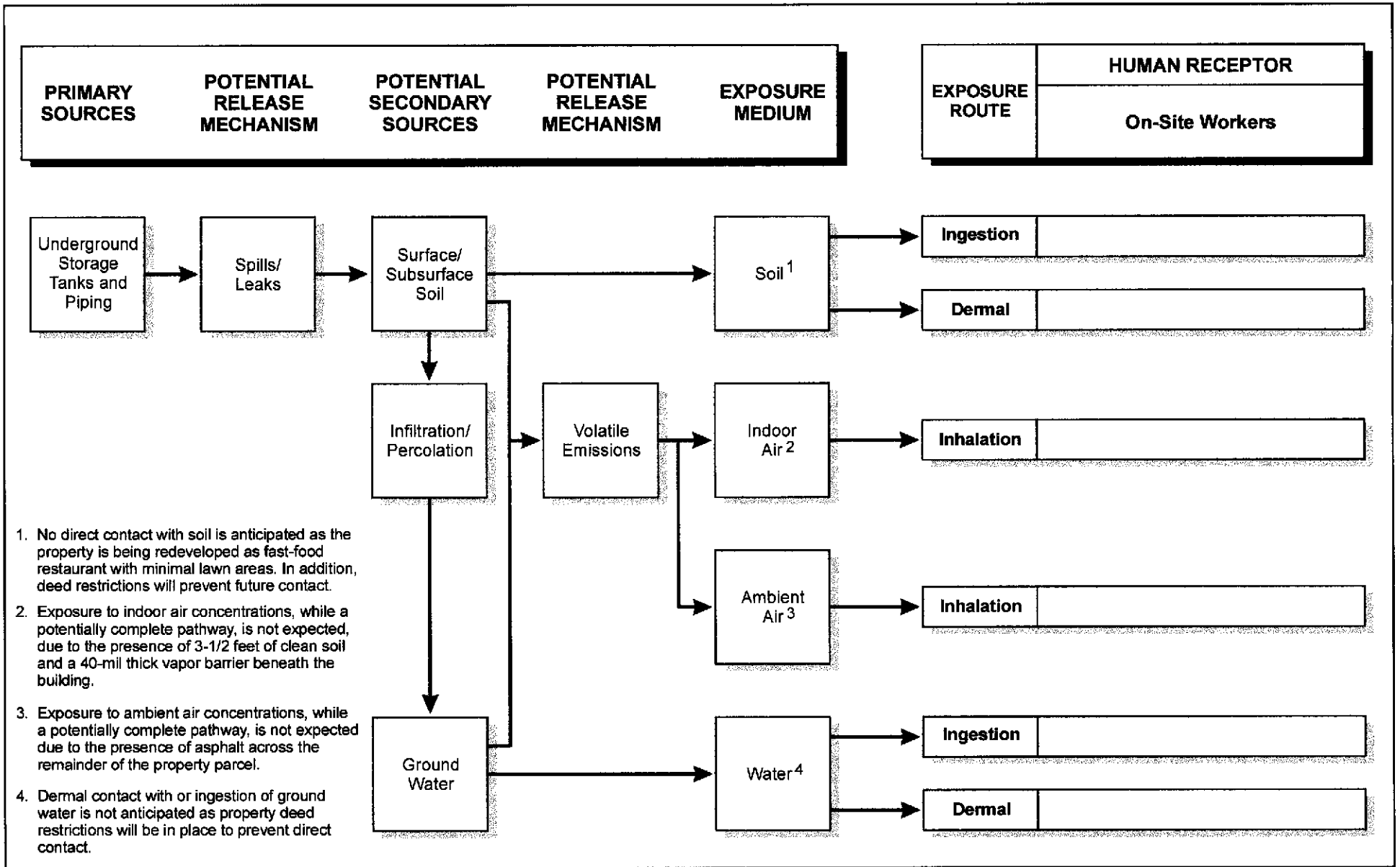

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