NCD 003 185 238

TRIANGLE ENVIRONMENTAL INC.

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May 17, 2000

Mr. Thomas J. Walker
Hazardous Waste Section
Waste Management Division – NCDENR
401 Oberlin Road
1646 Mail Service Center
Raleigh, NC 27699-1646

Reference: Response to Request for Supplemental Information
Alcatel Network Systems, Inc.
Raleigh, NC
NCD 003 185 238

Dear Mr. Walker,

On behalf of our client, Alcatel Network Systems, Inc., Triangle Environmental, Inc. (Triangle) is submitting the following response to your January 6, 2000 *Request for Supplemental Information*. Please review the attachments that address each of your requests in detail.

Phase II RFI Report Comments

1. You recommended that Alcatel determine the potential for groundwater contaminants to impact the indoor air quality and expose workers to undue risks. Additionally, you suggested the methodologies described in the draft copy of the *North Carolina Risk Analysis Framework (NCRAF).*

   The NCRAF recognizes six potential pathways for contaminants to expose humans (three for soil and three for groundwater). The transfer of the contaminants from groundwater to indoor air is referred to as pathways G-2. To evaluate the risk of this pathway and identify target clean up in a tiered approach (Methods I, II, and III) is proposed to evaluate risk. Each successive method uses more site-specific information to determine the target concentrations for groundwater and soil. The advantage of this "risk-based" system is that it allows clean up to levels above established groundwater standards.

- Method I involves the use of "look-up" tables of non-site specific target concentrations that are calculated NCDENR.
- Method II allows the responsible party to calculate target concentrations using some site-specific data and specified models and equations.
- Method III builds on Method II by allowing models other than those presented by NCDENR in Method II to be used, if certain model criteria are met.

Rather than using theoretical models and analyses, Alcatel chose to secure a Certified Industrial Hygienist (CIH) to conduct indoor air quality sampling of selected workspaces near the source area to determine whether contaminants have transferred to the indoor air. Sampling locations were chosen to attempt to measure the potential "worst case" conditions. Two sample locations were chosen in an area above the highest concentrations of contaminants under the building. One was an office that receives normal ventilation from the plant HVAC system. The other was a closet that has no ventilation, a condition which would allow any vapors to accumulate. The samples were taken on the weekend when the air disturbance and exchange through doors, etc. would be at a minimum. The results of this evaluation are also included in Attachment A. Note that no target compounds are found to occur above method detection limits. Since no contaminants were detected, Triangle believes that this potential exposure pathway can be eliminated. A copy of the CIH's report is included in Attachment A.

2. Attachment B contains a revised certification page for the *Phase II RFI Report.* Please replace the original with this one.

3. Included in Attachment C is a revised hydrogeologic cross section along the longitudinal axis of the plume that contains the information you requested. This exact location of the cross section is depicted on a site map in Attachment C.

   Data provided by David Blake , Ph.D. who has performed extensive geological mapping in the Raleigh area indicates that the trending fractures in the area are north 20° east. Lines trending this orientation are included on a figure in Attachment C. Further fracture trace analyses on site would require extensive geophysical analyses and potentially new boreholes be installed. Triangle does not feel that this is warranted since the general plume geometry agrees with that which would be expected in light of Dr. Blake's data.

4. A statistical analysis was conducted to determine if lead and copper analyses from upgradient, plume/source and downgradient wells reflected any statistical difference.

   MW-10s, MW-9s, MW-7s and MW1s were selected as typical upgradient or background wells for statistical analyses. MW-13s, MW-2s, MW-11s and MW-14s were selected as source area or plume wells. MW-9sk, CRW-1, CRW-5 and

CRW-11 were selected as downgradient wells. MW'15s was not selected because only one data point exist from this well. The USEPA GRIT/STAT Version 5.0 software was utilized to perform a statistical analysis of this data, and it was determined that no statistically significant variation occurs among the Copper and Lead in groundwater at the site. Therefore, no additional sampling for these parameters should be conducted. The analyses, methodology and results are indicated in Attachment D.

5. The NCRAF was used to evaluate the potential of the groundwater contaminant plume to impact surface water bodies (Crabtree Creek). This pathway is identified as G-3 by NCRAF. Method I could not be employed because the NCRAF states that it is not to be used if the plume has a length greater than 100 feet. Therefore, Method II and the G3TM model was utilized. This model was applied to the surficial aquifer rather than the bedrock aquifer for the following reasons:

    - Although flow between these units is not restricted, existing data shows that the potientometric surface in the deep wells is 1-3 feet below adjacent wells screened in the surficial deposits.
    - Additionally, the base of Crabtree Creek does not extend the 30 or more feet necessary to truncate the bedrock unit.

    An explanation of the source of input parameters and model output is described in Attachment E. In summary 1, -DCE and PCE occur at concentrations above the target concentrations necessary to protect surface water. This model is rejected because it suggests that the maximum concentration at the stream interface would occur at between five to six years. This is known not to be true since the plume leading edge has not migrated to that distance in the ten years that assessment has taken place on site and the estimated 20-25 years since the initial release.

    Following this analysis, a model was selected for Method III. Biochlor is a publicly available model that was developed specifically by the EPA for chlorinated solvent plumes. A summary of the Biochlor model that addresses all conditions necessary for model selection in the NCRAF is included in Attachment E.

    The model was calibrated against existing data and it correlates well. Runs of this model at various intervals between 5 and 75 years indicates that the plume reaches a "steady-state" after a period of approximately 15 years. In other words, downgradient migration of the plume equals biodegradation and dispersion and the plume leading edge actually ceases to migrate forward. The model indicates that the plume leading edge will terminate at a distance of approximately equal to MW-15s. This appears to be consistent with site data. Based on this model data, it is suggested that the potential impact to Crabtree Creek does not occur.

Interim Measures Reports Comments

1. It was questioned why the data for the MW-5sk was exponential rather than linear. The graphing packing in Microsoft Excel calculates the R^2 for the line. R^2 is an indicator of the fit of line equation to existing data points. Included in attachment E are copies of the data plotted along with a best-for linear equation and a best-fit exponential equation. Note that the R^2 value indicates a better fit for the exponential line than for the linear line. Therefore, the explanation is that the data provides a greater degree of correlation to an exponential line.

2. The trend of increasing concentrations in MW-4dd can be caused by two mechanisms.

   First is the hypothesis that drilling or well construction methods have allowed a preferential pathway for contaminants to migrate vertically downward. The second is that the contaminants are migrating downward farther upgradient. The sampling of the RW-1 to indicate whether RW-1 is drawing contaminants to the area and they are migrating downward or whether IW-1 is causing mounding and enhancing vertical migration only addressed one of the potential methods by which contaminants could migrate to the zone where MW-4dd is screened.

   Additionally, RW-1 is screened in an interval that connects the zones screened by MW-4s and MW-4d. It is recommended that MW-4s be included in the sampling scheme rather than RW-1. This would allow contrasting of MW-4s, MW-4d, and MW-4dd. If the levels in MW-4s trend similarly to those in MW-4dd then it is possible that contaminants are migrating vertically downward as suggested. As depicted on the cross section in Attachment D, Triangle suggests that the contaminants are migrating downward upgradient.

Based on observed and modeled data, Triangle concludes that the potential migration to Crabtree Creek is extremely unlikely. Testing by a CIH has shown that transfer of the contaminants to the indoor air is not occurring and the CIH has recommended no further action. Triangle believes that this potential exposure pathway can be eliminated from further consideration.

Triangle and Alcatel appreciate your comments and would appreciate your consideration and feedback on this letter.

Sincerely,

TRIANGLE ENVIRONMENTAL, INC.

Ray S. Taylor, PE
Vice President

/nb

NORTH CAROLINA PROFESSIONAL SEAL 7747 ENGINEER RAY STANLEY TAYLOR

Attachment A

Certified Industrial Hygienist Report of Indoor Air Quality Investigation

AIR SAMPLING SURVEY
Facilities Investigation RCRA #NCD003185238

ALCATEL U.S.A.
2912 Wake Forest Road
Raleigh, NC

Prepared by:

MIKE SHRIMANKER, PE, CIH, CSP

EEC, INC.
INDUSTRIAL HYGIENE SERVICES
107 WIND CHIME COURT
RALEIGH, NC 27615
(919) 846-1016

BACKGROUND

EEC was contacted to perform an air sampling survey for potential organic vapor release in an indoor environment due to groundwater contamination in the specified locations.

On April 7, 2000, a visit was made to the Alcatel, USA, Wake Forest building to collect air samples for solvent vapors at specific locations. One sample was collected in Larry Johnson's office and second sample was collected in the Transformer room. Both samples were collected at 1' height above the floor level. The sampling protocol included low flow DuPont pumps pre-calibrated with charcoal tubes. The samples were collected over along period of time to collect detectable amount of the chemicals listed below:

1. 1,1 Dichloroethane
2. 1,1 Dichloroethene
3. Tetrachloroethene
4. 1,1,1 Trichloroethane
5. Trichloroethene
6. Chloroform
7. 1,2 Dichloroethane

The samples were collected at the sampling rate above 200 cubic centimeter per minute. The pumps were post calibrated after the sampling was discontinued. Air was passed through an activated charcoal in 400 milligram tube. One sample was started in Larry Johnson's office at 4:45 PM and another sample was started in the Transformer room at 4:49 PM on Friday (April 7, 2000). The sampling was discontinued at both locations on Sunday (April 9, 2000) at 7:21 AM and 7:22 AM respectively. The samples were put in refrigerated and then sent to the lab on Monday for analysis for the compounds listed above. The laboratory performing these analysis is an AIHA accredited laboratory.

The results for each compound listed above is below the detection limit of the instrument. The detection limit for each compound is specified in the report.

The amount of release of any vapors from the contaminated groundwater is potentially very low (below the detection limit). We recommend no further action.

RESULTS

Sample Number	Location	Volume Liters	Analytes	Exposure in ppm
ATL-13	Larry Johnson's Office	579	1,2-Dichloroethene	<0.017
			Tetrachloroethene	<0.01
			Chloroform	<0.014
			1,2-Dichloroethene	<0.017
			1,1 Dichloroethane	<0.017
			1,1,1 Trichloroethane	<0.013
			Trichloroethane	<0.013
ATL-14	Transformer Room	550	1,2-Dichloroethene	<0.018
			Tetrachloroethene	<0.011
			Chloroform	<0.015
			1,2-Dichloroethene	<0.018
			1,1 Dichloroethane	<0.018
			1,1,1 Trichloroethane	<0.013
			Trichloroethane	<0.013

Definitions:
PPM = Parts of contaminant per million parts of air sampled

Attachment B

Certification of Phase II RCRA Facility Investigation

CERTIFICATION OF PHASE II RCRA FACILITY INVESTIGATION

ALCATEL NETWORK SYSTEMS, INC.
2912 WAKE FOREST ROAD
RALEIGH, NORTH CAROLINA

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations.

Date: May 19, 2000

Signature: Dikran V. Kabbendjian

Mgr. ENV. Health & Safety
Title

Attachment C

Maps