

Draft - Subject to QC Checking and Refinement

To: Brent Kerger

From: Bill Butler

Date: Monday, August 7, 1995

Re: Anticipated Findings from Contacts with Dr. Zhang; Budget

Post-it™ Fax Note 7671		Date 8/7/95	# of pages 6
To Brent Kerger	From Bill Butler		
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What Product Will Be Generated?

You requested a description of the anticipated product of this work. I foresee two written reports. The first report will be a summary of the findings from our contact with Zhang. This first report can be used as the foundation of a number of trial exhibits that summarize the absence of the association between cancer and groundwater exposure to Cr+6 in JinZhou, China. The issues of this first report are the same as those contained in the section below on Work to Date.

The second report will be a Letter to the Editor or Brief Communication to a peer reviewed journal containing the a subset of the material in the first report. I expect that Dr. Zhang will be the first author of this Letter to the Editor or Brief Report.

A third possible product is Dr. Zhang's attendance at a meeting in the US with other chromium researchers. This product depends on factors other than Dr. Zhang's research and is not addressed further in this memo.

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Approximate Budget

I request authorization for an additional \$25,000 for services to be executed between now and September 1. I believe that this amount will fund the writing the first draft of the first report (pending edits from you, Paustenbach, Finley and others) and probably the second as well. I believe this amount will also fund the accumulation from Zhang of all the available Cr6+ contamination data. However, I am not certain of the later because I do not know the exact amount of this information or the speed with which Zhang will provide it to us (see next section).

Butler	Project coordination; Requests to Zhang; Interpret Data; Write reports	60 hrs at \$225/hr	\$13,500
Ye	Telephone conversation with Zhang; Translation; Acquisition of Materials on Cancer in China; Computer Program	75 hrs at \$90/hr	\$6,750
Secretary	Word processing; FAX; Mail; Filing	16 hrs at \$49/hr	\$980
Graphics	Maps for JinZhou; Cancer Atlas Maps for China and LiaoNing		\$900
Subtotal			\$22,130
3% Comm Fee			\$22,794
Zhang	Research assistance	\$350/ month for 4 months +expns	\$1,600
20% Markup			\$1,920
Total			\$24,714

Communication with Zhang

As we have discussed, substantial progress has been made in obtaining additional information from Dr. Zhang regarding his research on cancer and chromium exposure via drinking water in JinZhou County, China. Our progress has been at times slower than we would like for a number of reasons including:

- i) Language;
- ii) Time differences (5pm Monday in SF is 8am Tuesday in JinZhou);
- iii) Communication equipment (FAX) is less accessible to Dr. Zhang;
- iv) Dr. Zhang is elderly and retired and, thus, does not on every day have as much energy for this project as we would like;
- v) Zhang conducted his study more than a decade ago and:
 - a) Paper records of the research may not be available. There were never computer records for this research.
 - b) In the absence of the paper records, Dr. Zhang cannot always at first effort remember the specifics of the background data of his research.
- vi) It is at times difficult to convince Dr. Zhang of the importance to us of the specific details of his studies so that we can execute our own analyses. The absence of the regard for the background data/ details of the research is indicated in the level of detail provided in Dr. Zhang's own manuscripts as well as the manuscripts of other Chinese researchers.

Work to Date

The following is a brief summary of our findings to date and of the additional work that I recommend be executed.

- * As I have already reported to you, Zhang's results indicate that *lower* cancer rates are associated with living closer to the Alloy Plant and having more Cr6+ in the drinking water for a longer period of time. This pattern is the opposite of what is expected if Cr6+ were a cause of cancer in this population.

This is one of the major finding of our contact with Zhang. We are continuing to work with Zhang to obtain (at least approximate) background data for these rates so that we can present a quantitative examination of the absence of a positive dose-response relationship between cancer and Cr6+ in drinking water. This work is taking additional time because of the need to use indirect methods to reconstruct the number of cancer deaths in each village. Dr. Zhang no longer has records of the number of cancer deaths for these populations.

- * In examining whether Cr6+ could be a carcinogen by the oral route, the ATSDR reviewed the article of Zhang and Li (1987; Journal of Chinese Preventive Medicine, 21: 262-264; as translated by ATSDR) and stated (page 57 of the Toxicological Profile of Chromium):

"The higher cancer rates were found for those who lived closer to the dump site (of the Alloy Plant, the suspected source of the Cr6+ in the groundwater.)"

The ATSDR's statement is apparently based on the following quote from Zhang and Li:

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"In addition, the findings revealed that the closer the dump site the higher the mortality from malignant cancer. " (pg 137 of the ATSDR translation)

This quote appears to contradict the data presented by Zhang and Li in the manuscript provided to ChemRisk and which was not available to the ATSDR. We questioned Zhang about this apparent contradiction. He said that his intended meaning of that statement was that all the villages in his study area (and, thus, close to the dump site) had an average cancer rate that was higher than the average for JinZhou county. Zhang said that he did not intend to communicate that there was a dose-response pattern between cancer and the concentration of Cr6+ in the drinking water. Given this intended meaning (which is reasonable), there does not appear to be a contradiction between the 1987 paper and the mortality article provided to ChemRisk. However, the ATSDR's statement is misleading because it implies that a positive dose-response pattern was observed.

- * ChemRisk is continuing to work with Zhang to accumulate other data to address whether i) all the villages near the Alloy Plant had a higher cancer rates than expected; and ii) whether these higher cancer rates could be due to Cr6+ exposure.

This work entails collecting information on cancer rates in other areas of JinZhou, in LiaoNing in general and in all of China. These cancer rates will allow a comparison of the cancer rates for the area around the Alloy Plant with the natural/ background variability in cancer rates in China.

- * In none of the articles currently available to us has Zhang directly examined the relationship of cancer rates with either Cr6+ in drinking water or dose of Cr6+ from drinking water. ChemRisk is continuing to work with Zhang to accumulate the available

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data on Cr6+ in groundwater to obtain estimates of average concentration of Cr6+ by calendar year. ChemRisk is also working with Zhang to use these data, along with information on average water consumption, to reconstruct a dose measurement by calendar year.

- * Zhang has provided to us unpublished, summary data on the acute symptoms (diarrhea, vomiting) observed in 1965 in the two communities closest to the Alloy Plant. We are continuing to work with Zhang to collect more details of this research for the purpose of examining if a dose level can be identified below which residents did not report symptoms.