BIOAVAILABILITY OF LEAD IN SOIL AND MINE WASTE FROM THE CALIFORNIA GULCH NPL SITE LEADVILLE, CO

June 1998

PHASE II SWINE BIOAVAILABILITY INVESTIGATIONS

BIOAVAILABILITY OF LEAD IN SOIL AND MINE WASTE FROM THE CALIFORNIA GULCH NPL SITE LEADVILLE, COLORADO

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EXECUTIVE SUMMARY

A study using young swine as test animals was performed to measure the gastrointestinal absorption of lead from four different test materials collected at the California Gulch Superfund Site, located in and about the community of Leadville, Colorado. Young swine were selected for use in the study primarily because the gastrointestinal physiology and overall size of young swine are similar to that of young children, who are the population of prime concern for exposure to soil lead.

The four test materials were each from different areas of the site. The following table summarizes the nature of these samples:

Sample Name	Sample Description	Lead Concentration
Phase I Residential Composite	Composite of surface soil from 28 different locations in the main residential area of Leadville	7,510 ppm
Fe-Mn-Pb Oxide	Composite of three surface soils from near the Lake Fork Trailer Park	4,320 ppm
AV Slag	Sample of fines located at the base of a large pile of water-quenched slag at the former AV Smelter	10,600 ppm
Oregon Gulch	Composite of several subsamples of tailings material collected from the Oregon Gulch tailings impoundment	1,270 ppm

The gastrointestinal absorption of lead in these test materials was investigated in a series of three different studies. The designs of these studies were generally similar, with groups of 4-5 swine being exposed to test material and reference material (lead acetate) for 15 days. However, there was some variation in the dose levels administered, as summarized below:

Study	Test Materials Administered	Dose Level (ug Pb/kg-day)	
		Test Material	Lead Acetate
7	Phase I Composite Fe-Mn-Pb Oxide	0, 25, 75, 225	0, 25, 75
8	AV Slag	0, 25, 75, 225	0, 25, 75
12	Oregon Gulch	0, 225	0, 25, 75, 225

The amount of lead absorbed by each animal in each study was evaluated by measuring the amount of lead in the blood (measured on days -4, 0, 1, 2, 3, 5, 7, 9, 12, and 15), and the amount of lead in liver, kidney and bone (measured on day 15 at study termination). The amount of lead present in blood or tissues of animals exposed to test materials was compared to that for animals exposed to lead acetate, and the results were expressed as relative bioavailability (RBA). For example, a relative bioavailability of 50% means that 50% of the lead in a test material was absorbed equally as well as lead from lead acetate, and 50%

behaved as if it were not available for absorption. Thus, if lead acetate were 40% absorbed into the body, about 20% of the lead in the test material would be absorbed into the body.

The RBA results for the four samples from the California Gulch site are summarized below:

Measurement Endpoint	Test Material			
	Phase I Composite	Fe-Mn-Pb Oxide	AV Slag	Oregon Gulch
Blood Lead AUC	0.71	0.87	0.20	0.06
Liver Lead	0.92	0.96	0.11	0.05
Kidney Lead	0.91	1.24	0.10	0.04
Bone Lead	0.62	0.84	0.18	0.004

Because the estimates of RBA based on blood, liver, kidney, and bone do not agree in all cases, judgment must be used in interpreting the data. In general, we recommend greatest emphasis be placed on the RBA estimates derived from the blood lead data. This is because blood lead data are more robust and less susceptible to random errors than the tissue lead data, so there is greater confidence in RBA estimates based on blood lead. In addition, absorption into the central compartment is an early indicator of lead exposure, is the most relevant index of central nervous system exposure, and is the standard measurement endpoint in investigations of this sort. However, data from the tissue endpoints (liver, kidney, bone) also provide valuable information. We consider the plausible range to extend from the RBA based on blood AUC to the mean of the other three tissues (liver, kidney, bone). The preferred range is the interval from the RBA based on blood to the mean of the blood RBA and the tissue mean RBA. Our suggested point estimate is the mid-point of the preferred range. These values are presented below:

Relative Bioavailability of Lead	Test Material			
	Phase I Composite	Fe-Mn-Pb Oxide	AV Slag	Oregon Gulch
Plausible Range	0.71 - 0.82	0.87 - 1.0	0.13 - 0.20	0.03 - 0.06
Preferred Range	0.71 - 0.76	0.87 - 0.94	0.16 - 0.20	0.05 - 0.06
Suggested Point Estimate	0.74	0.90	0.18	0.06

These RBA estimates may be used to help assess lead risk at this site by refining the estimate of absolute bioavailability (ABA) of lead in soil, as follows:

$$ABA_{soil} = ABA_{soluble} \cdot RBA_{soil}$$

Available data indicate that fully soluble forms of lead are about 50% absorbed by a child. Thus, the estimated absolute bioavailability of lead in the test soils are as follows:

Absolute Bioavailability of Lead	Test Material			
	Phase I Composite	Fe-Mn-Pb Oxide	AV Slag	Oregon Gulch
Plausible Range	36%-41%	43%-51%	6%-10%	2%-3%
Preferred Range	36%-38%	43%-47%	8%-10%	2%-3%
Suggested Point Estimate	**37%**	**45%**	**9%**	**3%**

These absolute bioavailability estimates are appropriate for use in EPA's IEUBK model for this site, although it is clear that there is both natural variability and uncertainty associated with these estimates. This variability and uncertainty arises from several sources, including : 1) the inherent variability in the responses of different individual animals to lead exposure, 2) uncertainty in the relative accuracy and applicability of the different measurement endpoints, 3) the extrapolation of measured RBA values in swine to young children, and 4) the potential effect of food in the stomach on lead absorption. Thus, the values reported above are judged to be reasonable estimates of typical lead absorption by children at this site, but should be interpreted with the understanding that the values are not certain.

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1.0 INTRODUCTION

Absolute and Relative Bioavailability

Bioavailability is a concept that relates to the absorption of chemicals and how absorption depends upon the physical-chemical properties of the chemical and its medium (e.g., dust, soil, rock, food, water, etc.) and the physiology of the exposed receptor. Bioavailability is normally described as the fraction (or percentage) of a chemical which enters into the blood following an exposure of some specified amount, duration and route (usually oral). In some cases, bioavailability may be measured using chemical levels in peripheral tissues such as liver, kidney, and bone, rather than blood. The fraction or percentage absorbed may be expressed either in absolute terms (absolute bioavailability, ABA) or in relative terms (relative bioavailability, RBA). **Absolute bioavailability** is measured by comparing the amount of chemical entering the blood (or other tissue) following oral exposure to test material with the amount entering the blood (or other tissue) following intravenous exposure to an equal amount of some dissolved form of the chemical. Similarly, **relative bioavailability** is measured by comparing oral absorption of test material to oral absorption of some fully soluble form of the chemical (e.g., either the chemical dissolved in water, or a solid form that is expected to fully dissolve in the stomach). For example, if 100 ug of dissolved lead were administered in drinking water and a total of 50 ug entered the blood, the ABA would be 0.50 (50%). Likewise, if 100 ug of lead in soil were administered and 30 ug entered the blood, the ABA for soil would be 0.30 (30%). If the lead dissolved in water were used as the reference substance for describing the relative amount of lead absorbed from soil, the RBA would be 0.30/0.50 = 0.60 (60%). These values (50% absolute bioavailability of dissolved lead and 30% absolute absorption of lead in soil) are the values currently employed as defaults in EPA's IEUBK model.

It is important to recognize that simple solubility of a test material in water or some other fluid (e.g., a weak acid intended to mimic the gastric contents of a child) may not be a reliable estimator of bioavailability due to the non-equilibrium nature of the dissolution and transport processes that occur in the gastrointestinal tract (Mushak 1991). For example, fluid volume and pH are likely to be changing as a function of time, and transport of lead across the gut will prevent an approach to equilibrium concentrations, especially for poorly soluble lead compounds. However, information on the solubility of lead in different materials is useful in interpreting the importance of solubility as a determinant of bioavailability. To avoid confusion, the term "bioaccessability" is preferred when referring to the amount of lead that dissolves under a specified set of test conditions.

For additional discussion about the concept and application of bioavailability see Goodman et al. (1990), Klaassen et al. (1996), and/or Gibaldi and Perrier (1982).

Using Bioavailability Data to Improve Exposure Calculations for Lead

Data on bioavailability are important for evaluating exposure and potential health effects for a variety of different types of chemicals. This investigation focused mainly on evaluating the bioavailability of lead in various samples of soil or other solid materials from mining, milling or smelting sites. This is because lead may exist, at least in part, as poorly water soluble minerals (e.g., galena), and may also exist inside particles of inert matrix such as rock or slag of variable size, shape and association. These chemical and physical properties may tend to influence (usually decrease) the solubility (bioaccessability) and the absorption (bioavailability) of lead when ingested.

When data are available on the bioavailability of lead in soil, dust, or other soil-like waste material at a site, this information can often be used to improve the accuracy of exposure and risk calculations at that site. The basic equation for estimating the site-specific ABA of a test soil is as follows:

$$ABA_{soil} = ABA_{soluble} \cdot RBA_{soil}$$

where:

ABA_{soil}	=	Absolute bioavailability of lead in soil ingested by a child
$ABA_{soluble}$	=	Absolute bioavailability in children of some dissolved or fully soluble form of lead
RBA_{soil}	=	RBA for soil measured in swine

Based on available information in the literature on lead absorption in humans, the EPA estimates that the absolute bioavailability of lead from water and other fully soluble forms of lead is usually about 50% in children. Thus, when a reliable site-specific RBA value for soil is available, it may be used to estimate a site-specific absolute bioavailability as follows:

$$ABA_{soil} = 50\% \cdot RBA_{soil}$$

In the absence of site-specific data, the absolute absorption of lead from soil, dust and other similar media is estimated by EPA to be about 30%. Thus, the default RBA used by EPA for lead in soil and dust compared to lead in water is 30%/50% = 60%. When the measured RBA in soil or dust at a site is found to be less than 60% compared to some fully soluble form of lead, it may be concluded that exposures to and hazards from lead in these media at that site are probably lower than typical default assumptions. If the measured RBA is higher than 60%, absorption of and hazards from lead in these media may be higher than usually assumed.

2.0 STUDY DESIGN

A standardized study protocol for measuring absolute and relative bioavailability of lead was developed based upon previous study designs and investigations that characterized the young pig model (Weis et al. 1995). This study was performed as nearly as possible within the spirit and guidelines of Good Laboratory Practices (GLP: 40 CFR 792). Standard Operating Procedures (SOPs) that included detailed methods for all aspects of the study were prepared, approved, and distributed to all study members prior to the study. The generalized study design, quality assurance project plan and all standard operating procedures are documented in a project notebook that is available through the administrative record.

2.1 Test Materials

2.1.1 Sample Descriptions

Four different test materials from the California Gulch Superfund Site were collected and analyzed in this investigation. A description of each of these samples is provided below.

Phase I Residential Soil Composite

This soil sample was collected early in the program, and was used in previous studies referred to as "Phase I". It consisted of a composite of surface soils (0-6 inches) from 28 different residential properties within Leadville. Each sub-sample was selected to have a lead concentration of at least 6,000 ppm, with actual values ranging from 6,380 ppm to 21,380 ppm. The final lead concentration in the composite sample was 7,510 ppm.

Fe-Mn-Pb Oxide Soil Sample

This sample was a composite of three different surface soil samples (0-6 inches) collected near the Lake Fork Trailer Park, located southwest of Leadville near the Arkansas River. Because lead speciation studies indicated that lead in this area consisted largely of iron-lead oxide and manganese-lead oxide, this sample was referred to as the "Fe-Mn-Pb Oxide" sample. The final lead concentration in the composite was 4,320 ppm.

AV Smelter Slag Sample

This sample was collected from the toe of a steep slope on the northern edge of a large pile of water-quenched slag which remains on the property of the former Arkansas Valley (AV) Smelter, located just west of Leadville. The lead concentration in the sample was 10,600 ppm.

Oregon Gulch Tailings Sample

This sample was a composite of several subsamples of tailings collected from the Oregon Gulch tailings impoundment located in Oregon Gulch, just south of Leadville. The lead concentration in the composite sample was 1,270 ppm.

2.1.2 CLP Analyses

Each of the four different samples were sieved using a 60-mesh nylon screen, and only the fine fraction (particles less than about 250 um in diameter) derived from each sample were evaluated. This is because it is believed that particles less than about 250 um are most likely to adhere to the hands and be ingested by hand-to-mouth contact, especially in young children.

Table 2-1 lists the metal content of these sieved samples, measured using standard EPA Contract Laboratory Program (CLP) methods.

2.1.3 Lead Phases

Each test material was analyzed by electron microprobe in order to characterize the lead minerals present in the sample. The results are summarized in Figure 2-1. The solid bars represent the length-weighted particle frequency of lead-bearing grains, and the open bars represent the approximate fraction of the total lead mass accounted for by each phase. Inspection of these graphs reveals the following main points:

- The Phase I Residential Soil Composite contains a variety of different lead phases, with lead phosphate and iron-lead oxide being most common in terms of particle frequency. However, the majority of the lead mass is accounted for by lead phosphate, manganese lead oxide and cerussite (lead carbonate).

- The FeMnPb Oxide soil sample is relative more enriched in manganese lead oxide and iron lead oxide, with manganese lead oxide accounting for most of the relative lead mass.

- As expected, the most common lead-bearing particle type in the AV slag sample is slag, but because the slag particles contain relatively low concentrations of lead, the majority of the relative lead mass is present in other forms, mainly iron-lead oxide and lead arsenic oxide.

- Lead in the sample of tailings from the Oregon Gulch impoundment consists entirely of galena (lead sulfide), both in terms of particle count and relative lead mass.

2.1.4 Particle Size Distributions

As noted above, small particles are often assumed to be more likely to adhere to the hands and be ingested and/or be transported into the house. Further, small particles have larger surface area-to-volume ratios than larger particles, and so may tend to dissolve more rapidly in the acidic contents of the stomach than larger particles. Thus, small particles (e.g., less than 25-50 um) are thought to be of greater potential concern to humans than larger particles (e.g., 100-250 um or larger).

Figure 2-2 summarizes the size distribution of lead-bearing particles present in each sample. As seen, there is a fairly wide size distribution in the Phase I Residential Soil Composite (Panel A), the FeMnPb Oxide sample (Panel B), and the AV Slag sample (Panel C), although in all

TABLE 2-1 METAL ANALYSIS OF TEST MATERIALS

Chemical	Concentration (ppm)			
	Residential Composite	Fe-Mn-Pb Oxide	AV Slag	Oregon Gulch
Aluminum	8670	11900	20800	248
Antimony	1.8	6.0	57.2	74.4
Arsenic	203	110	1050	1290
Barium	605	266	2430	14.2
Beryllium	0.06	1.0	1.2	2.0
Cadmium	59.9	38.5	12.8	4.0
Calcium	20100	3930	117000	8290
Chromium	9.1	7.5	43.1	8.0
Cobalt	2.0	6.9	53.8	10.1
Copper	657	165	2080	350
Iron	68120	27500	207000	391000
Lead	**7510**	**4320**	**10600**	**1270**
Magnesium	9521	2520	6360	118
Manganese	7090	1190	6910	126
Mercury	1.26	4.9	0.11	0.24
Nickel	5.6	7.5	7.1	28.2
Potassium	1500	1770	7390	451
Selenium	1.9	0.8	61.3	0.53
Silver	43	16.7	21.2	41.7
Sodium	6560	279	4080	34.1
Thallium	<0.5	3.7	1.8	0.86
Vanadium	33.7	17.9	37.2	47.7
Zinc	13738	2650	67300	441

FIGURE 2-1 LEAD MINERALS OBSERVED IN SITE SOILS

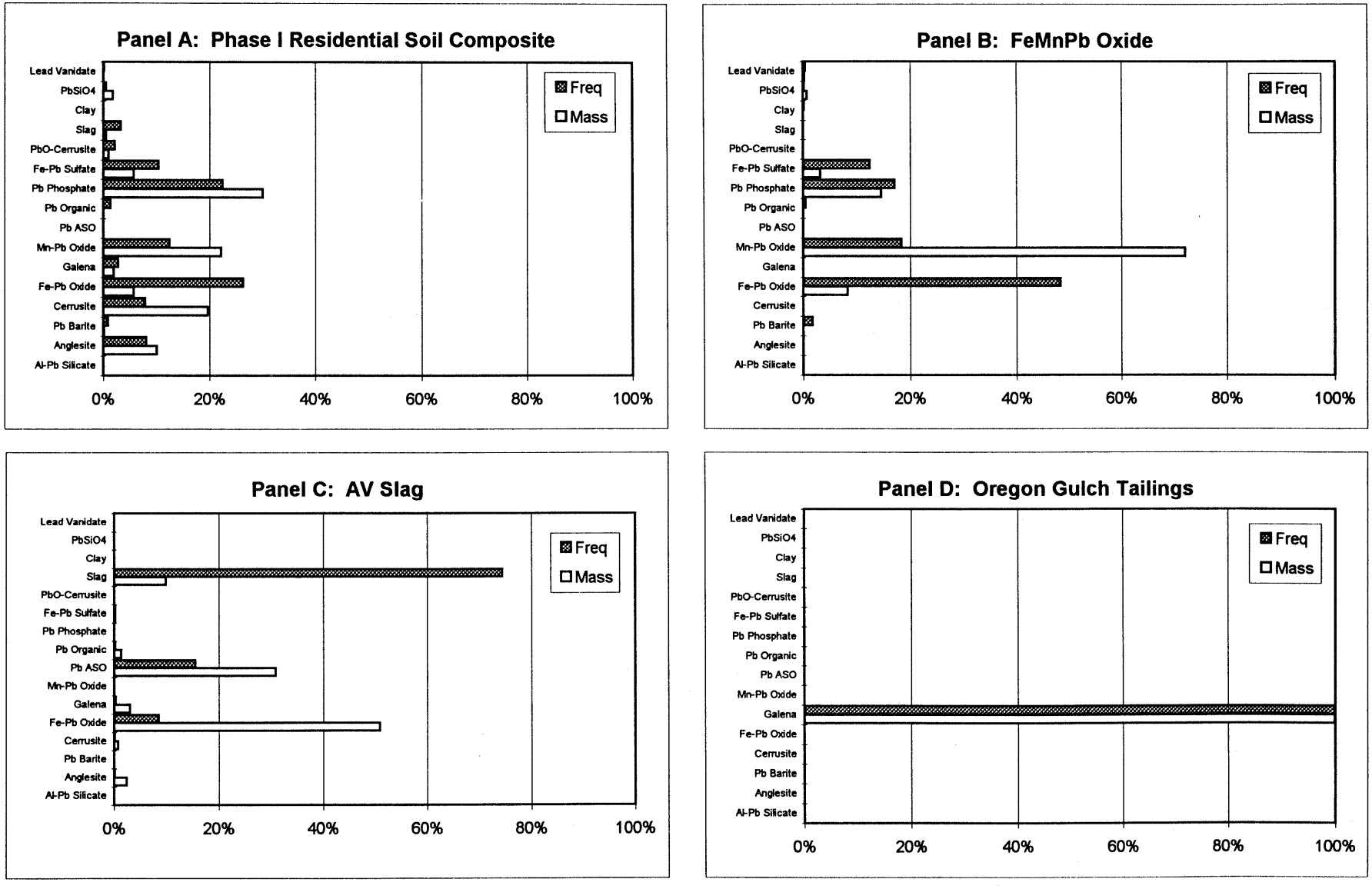
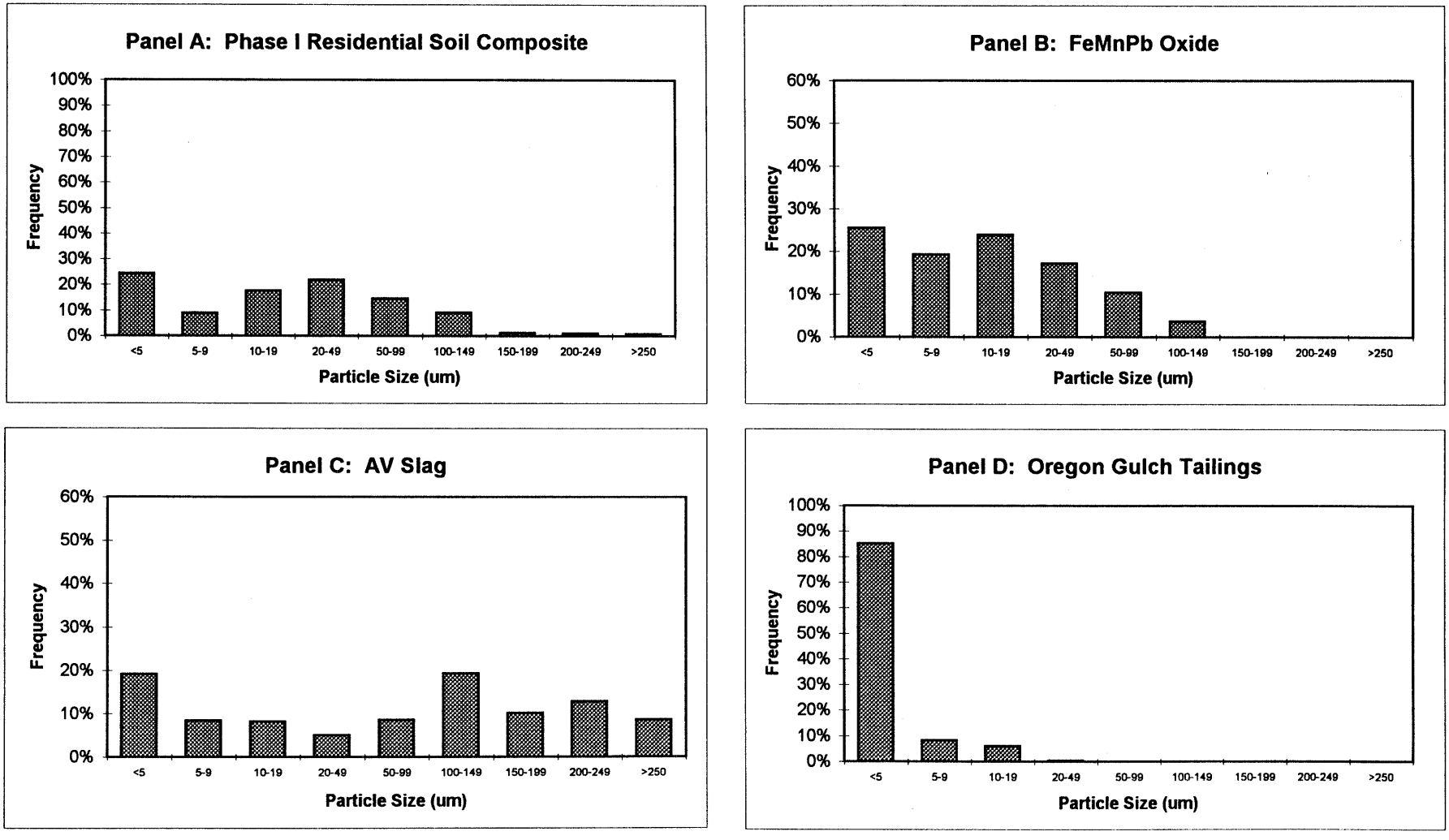


FIGURE 2-2 LEAD PARTICLE SIZE DISTRIBUTION



cases the majority of all lead-bearing particles are less than 50 um in length. The lead-bearing galena particles present in the Oregon Gulch tailings sample are especially small, with about 85% being less than 5 um in longest dimension.

2.1.5 Matrix Associations

If lead-bearing grains are entirely encased ("included") in a glassy or rocky matrix, the lead grains are less likely to be bioavailable that if they are partly or entirely exposed ("liberated"). Information on the fraction of lead-bearing grains that are included are summarized below:

Test Material	Percent of Lead Mass that is "Liberated"
Phase I Residential Composite	92%
FeMnPb Oxide	99%
AV Slag	80%
Oregon Gulch Tailings	5%

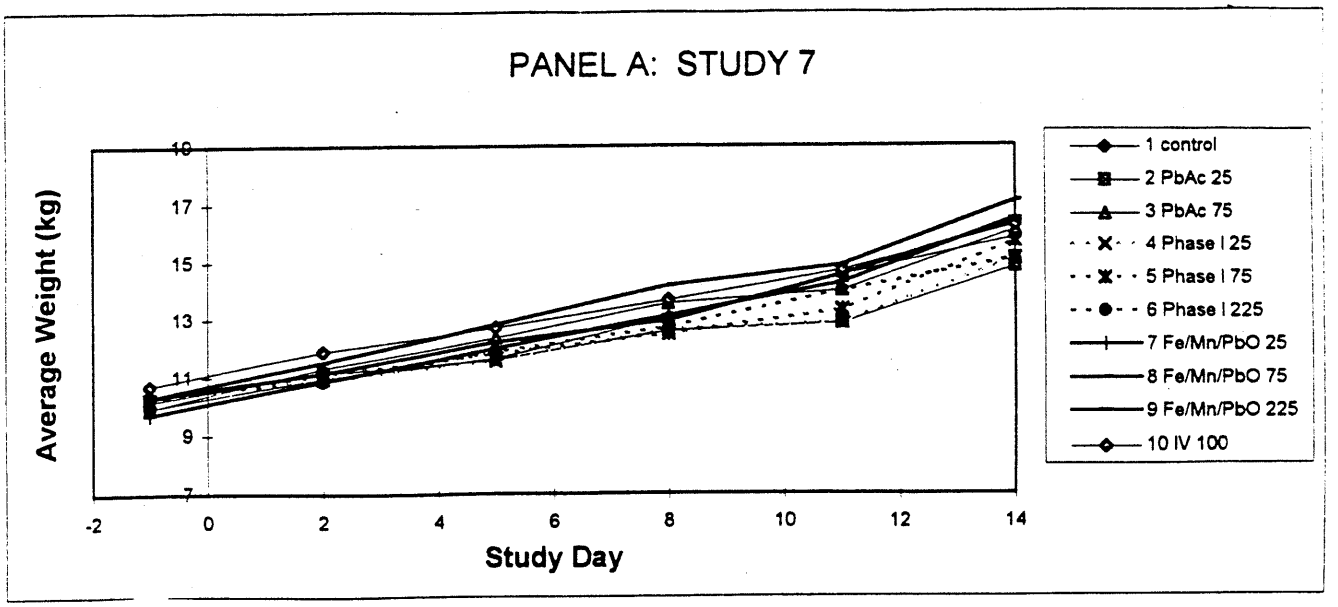
As seen, most of the lead mass in the first three test materials is partly or entirely liberated. In contrast, very few of the grains of galena observed in the Oregon Gulch tailings sample are liberated, with nearly 95% of the grains (and hence the lead mass) occurring entirely within the confines of slag particles.

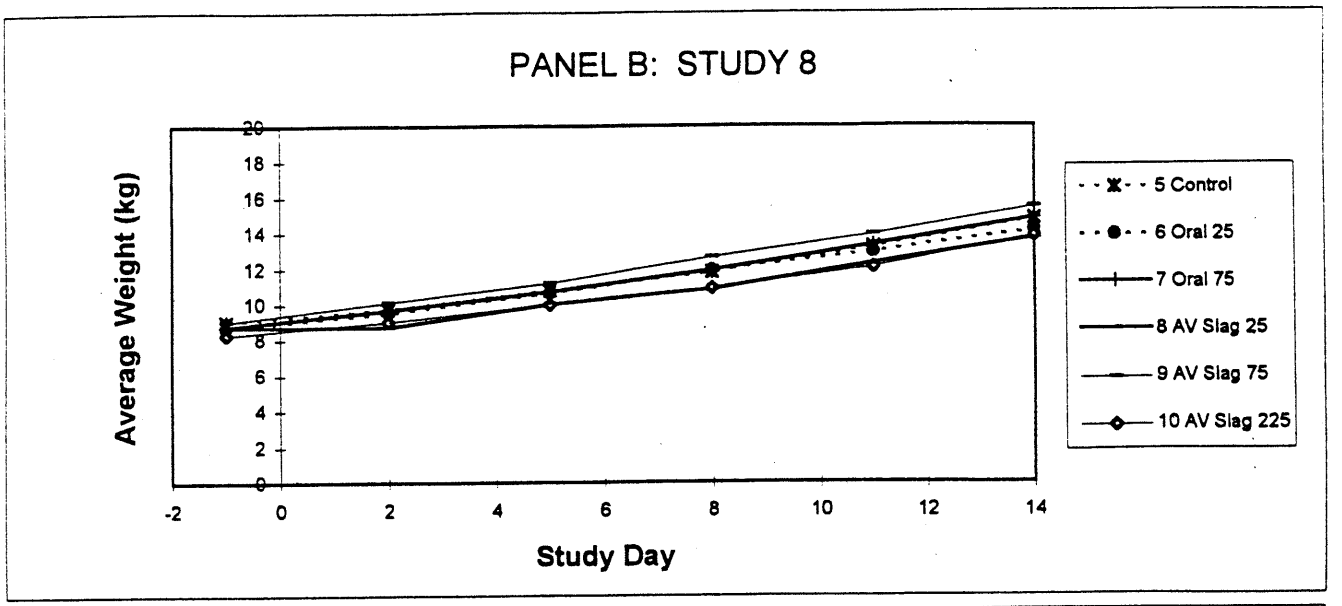
2.2 Experimental Animals

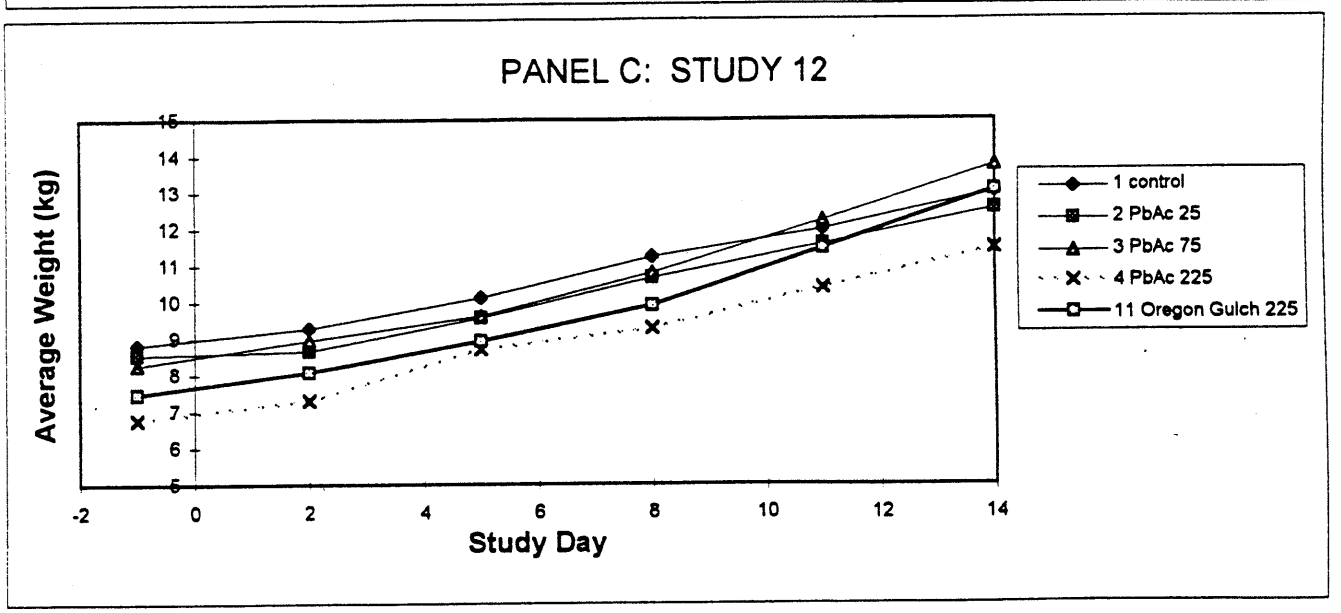
Young swine were selected for use in these studies because they are considered to be a good physiological model for gastrointestinal absorption in children (Weis and LaVelle 1991). The animals were intact males of the Pig Improvement Corporation (PIC) genetically defined Line 26, and were purchased from Chinn Farms, Clarence, MO. The animals were held under quarantine to observe their health for one week before beginning exposure to test materials. To minimize weight variations between animals and groups, the number of animals purchased from the supplier was six more than needed for the study, and the six animals most different in body weight on day -4 (either heavier or lighter) were excluded from further study. Any animals that appeared to be ill were also excluded. The remaining animals were assigned to dose groups at random. When exposure began (day zero), the animals were about 5-6 weeks old (juveniles, weaned at 3 weeks) and weighed an average of about 8-11 kg. Animals were weighed every three days during the course of the study. The group mean body weights over the course of each study are shown in Figure 2-3. On average, animals gained about 0.3 to 0.4 kg/day, and the rate of weight gain was comparable in all groups.

All animals were housed in individual lead-free stainless steel cages. Each animal was examined by a certified veterinary clinician (swine specialist) prior to being placed on study, and all animals were examined daily by an attending veterinarian while on study. Blood samples were collected for clinical chemistry and hematological analysis on days -4, 7, and 15 to assist in clinical health assessments. In the test groups covered in this report, there were no animals that were judged by the principal investigator and the veterinary clinician to be seriously ill, and no

FIGURE 2-3 BODY WEIGHTS OF TEST ANIMALS







animals were removed from the study due to concerns over poor health.

2.3 Diet

Animals provided by the supplier were weaned onto standard pig chow purchased from MFA Inc., Columbia, MO. In order to minimize lead exposure from the diet, the animals were gradually transitioned from the MFA feed to a special low-lead feed (guaranteed less than 0.2 ppm lead, purchased from Zeigler Brothers, Inc., Gardners, PA) over the time interval from day -7 to day -3, and this feed was then maintained for the duration of the study. The feed was nutritionally complete and met all requirements of the National Institutes of Health-National Research Council. The typical nutritional components and chemical analysis of the feed are presented in Table 2-2. Typically, the feed contained approximately 5.7% moisture, 1.7% fiber, and provided about 3.4 kcal of metabolizable energy per gram. Periodic analysis of feed samples during this program indicated the mean lead level (treating non-detects at one-half the quantitation limit of 0.05 ppm) was less than 0.05 ppm.

Each day every animal was given an amount of feed equal to 5% of the mean body weight of all animals on study. Feed was administered in two equal portions of 2.5% of the mean body weight at each feeding. Feed was provided at 11:00 AM and 5:00 PM daily. Drinking water was provided ad libitum via self-activated watering nozzles within each cage. Periodic analysis of samples from randomly selected drinking water nozzles indicated the mean lead concentration (treating non-detects at one-half the quantitation limit of 1 ug/L) was less than 2 ug/L.

2.4 Dosing

The dosing protocols for exposing animals to lead in each of the three different studies are shown in Tables 2-3, 2-4 and 2-5. The dose levels for lead acetate were based on experience from previous investigations that showed that doses of 25-225 ug Pb/kg/day gave clear and measurable increases in lead levels in all endpoints measured (blood, liver, kidney, bone). The doses of test materials were set at the same level as lead acetate, with one higher dose (225 ug Pb/kg-day) included in case the test materials were found to yield very low responses.

Animals were exposed to lead acetate or test material for 15 days, with the dose for each day being administered in two equal portions given at 9:00 AM and 3:00 PM (two hours before feeding). Doses were based on measured group mean body weights, and were adjusted every three days to account for animal growth. For animals exposed by the oral route, dose material was placed in the center of a small portion (about 5 grams) of moistened feed, and this was administered to the animals by hand. Most animals consumed the dose promptly, but occasionally some animals delayed ingestion of the dose for up to two hours (the time the daily feed portion was provided). These delays are noted in the data provided in Appendix 1, but are not considered to be a significant source of error. Occasionally, some animals did not consume some or all of the dose (usually because the dose dropped from their mouth while chewing). All missed doses were recorded and the time-weighted average dose calculation for each animal was adjusted downward accordingly.

Most studies also included one or more dose groups exposed to lead acetate by intravenous injection. The results of these studies are presented elsewhere.

TABLE 2-2 TYPICAL FEED COMPOSITION[a]

Nutrient Name	Amount	Nutrient Name	Amount
Protein	20.1021%	Chlorine	0.1911%
Arginine	1.2070%	Magnesium	0.0533%
Lysine	1.4690%	Sulfur	0.0339%
Methionine	0.8370%	Manganese	20.4719 ppm
Met+Cys	0.5876%	Zinc	118.0608 ppm
Tryptophan	0.2770%	Iron	135.3710 ppm
Histidine	0.5580%	Copper	8.1062 ppm
Leucine	1.8160%	Cobalt	0.0110 ppm
Isoleucine	1.1310%	Iodine	0.2075 ppm
Phenylalanine	1.1050%	Selenium	0.3196 ppm
Phe+Tyr	2.0500%	Nitrogen Free Extract	60.2340%
Threonine	0.8200%	Vitamin A	5.1892 kIU/kg
Valine	1.1910%	Vitamin D3	0.6486 kIU/kg
Fat	4.4440%	Vitamin E	87.2080 IU/kg
Saturated Fat	0.5590%	Vitamin K	0.9089 ppm
Unsaturated Fat	3.7410%	Thiamine	9.1681 ppm
Linoleic 18:2:6	1.9350%	Riboflavin	10.2290 ppm
Linoleic 18:3:3	0.0430%	Niacin	30.1147 ppm
Crude Fiber	3.8035%	Pantothenic Acid	19.1250 ppm
Ash	4.3347%	Choline	1019.8600 ppm
Calcium	0.8675%	Pyridoxine	8.2302 ppm
Phos Total	0.7736%	Folacin	2.0476 ppm
Available Phosphorous	0.7005%	Biotin	0.2038 ppm
Sodium	0.2448%	Vitamin B12	23.4416 ppm
Potassium	0.3733%		

[a] Nutritional values provided by Zeigler Bros., Inc.

TABLE 2-3 DOSING PROTOCOL
STUDY 7

Group	Number of Animals	Dose Material Administered	Exposure Route	Lead Dose (ug Pb/kg-d)	
				Target	Actual[a]
1	5	None	Oral	0	--
2	5	Lead Acetate	Oral	25	27
3	5	Lead Acetate	Oral	75	74
4	5	Phase I Composite	Oral	25	26
5	5	Phase I Composite	Oral	75	78
6	5	Phase I Composite	Oral	225	233
7	5	Fe-Mn-Pb Oxide	Oral	25	25
8	5	Fe-Mn-Pb Oxide	Oral	75	76
9	5	Fe-Mn-Pb Oxide	Oral	225	231

Doses were administered in two equal portions given at 9:00 AM and 3:00 PM each day. Doses were based on the mean weight of the animals in each group, and were adjusted every three days to account for weight gain.

[a] Calculated as the administered daily dose divided by the measured or extrapolated daily body weight, averaged over days 0-14 for each animal and each group.

TABLE 2-4 DOSING PROTOCOL
STUDY 8

Group	Number of Animals	Dose Material Administered	Exposure Route	Lead Dose (ug Pb/kg-d)	
				Target	Actual[a]
5	5	None	Oral	0	--
6	5	Lead Acetate	Oral	25	26
7	5	Lead Acetate	Oral	75	77
8	5	AV Slag	Oral	25	26
9	5	AV Slag	Oral	75	76
19	5	AV Slag	Oral	225	234

Doses were administered in two equal portions given at 9:00 AM and 3:00 PM each day. Doses were based on the mean weight of the animals in each group, and were adjusted every three days to account for weight gain.

[a] Calculated as the administered daily dose divided by the measured or extrapolated daily body weight, averaged over days 0-14 for each animal and each group.

TABLE 2-5 DOSING PROTOCOL
STUDY 12

Group	Number of Animals	Dose Material Administered	Exposure Route	Lead Dose (ug Pb/kg-d)	
				Target	Actual[a]
1	3	None	Oral	0	--
2	5	Lead Acetate	Oral	25	27
3	5	Lead Acetate	Oral	75	78
4	5	Lead Acetate	Oral	225	239
11	4	Oregon Gulch Tailings	Oral	225	232

Doses were administered in two equal portions given at 9:00 AM and 3:00 PM each day. Doses were based on the mean weight of the animals in each group, and were adjusted every three days to account for weight gain.

[a] Calculated as the administered daily dose divided by the measured or extrapolated daily body weight, averaged over days 0-14 for each animal and each group.

2.5 Collection of Biological Samples

Blood

Samples of blood were collected from each animal four days before exposure began (day -4), on the first day of exposure (day 0), and on days 1, 2, 3, 5, 7, 9, 12, and 15 following the start of exposure. All blood samples were collected by vena-puncture of the anterior vena cava, and samples were immediately placed in purple-top Vacutainer® tubes containing EDTA as anticoagulant. Blood samples were collected each sampling day beginning at 8:00 AM, approximately one hour before the first of the two daily exposures to lead on the sampling day and 17 hours after the last lead exposure the previous day. This blood collection time was selected because the rate of change in blood lead resulting from the preceding exposures is expected to be relatively small after this interval (LaVelle et al. 1991, Weis et al. 1993), so the exact timing of sample collection relative to last dosing is not likely to be critical.

Following collection of the final blood sample at 8:00 AM on day 15, all animals were humanely euthanized and samples of liver, kidney and bone (the right femur) were removed and stored in lead-free plastic bags for lead analysis. Samples of all biological samples collected were archived in order to allow for reanalysis and verification of lead levels, if needed, and possibly for future analysis for other metals (arsenic, cadmium, etc.). All animals were also subjected to detailed examination at necropsy by a certified veterinary pathologist in order to assess overall animal health.

2.6 Preparation of Biological Samples for Analysis

Blood

One mL of whole blood was removed from the purple-top Vacutainer and added to 9.0 mL of "matrix modifier", a solution recommended by the Centers for Disease Control and Prevention (CDCP) for analysis of blood samples for lead. The composition of matrix modifier is 0.2% (v/v) ultrapure nitric acid, 0.5% (v/v) Triton X-100, and 0.2% (w/v) dibasic ammonium phosphate in deionized and ultrafiltered water. Samples of the matrix modifier were routinely analyzed for lead to ensure the absence of lead contamination.

Liver and Kidney

One gram of soft tissue (liver or kidney) was placed in a lead-free screw-cap teflon container with 2 mL of concentrated (70%) nitric acid and heated in an oven to 90°C overnight. After cooling, the digestate was transferred to a clean lead-free 10 mL volumetric flask and diluted to volume with deionized and ultrafiltered water.

Bone

The right femur of each animal was removed and defleshed, and dried at 100°C overnight. The dried bones were then broken in half, placed in a muffle furnace and dry-ashed at 450°C for 48 hours. Following dry ashing, the bone was ground to a fine powder using a lead-free mortar and pestle, and 200 mg was removed and dissolved in 10.0 mL of 1:1 (v:v) concentrated nitric acid/water. After the powdered bone was dissolved and mixed, 1.0 mL of the acid solution was removed and diluted to 10.0 mL by addition of 0.1% (w/v) lanthanum oxide (La_2O_3) in deionized and ultrafiltered water.

2.7 Lead Analysis

Samples of biological tissue (blood, liver, kidney, bone) and other materials (food, water, reagents and solutions, etc.) were arranged in a random sequence and provided to EPA's analytical laboratory in a blind fashion (identified to the laboratory only by a chain of custody tag number). Each sample was analyzed for lead using a Perkin Elmer Model 5100 graphite furnace atomic absorption spectrophotometer. Internal quality assurance samples were run every tenth sample, and the instrument was recalibrated every 15th sample. A blank, duplicate and spiked sample were run every 20th sample.

All results from the analytical laboratory were reported in units of ug Pb/L of prepared sample. The quantitation limit was defined as three-times the standard deviation of a set of seven replicates of a low-lead sample (typically about 2-5 ug/L). The standard deviation was usually about 0.3 ug/L, so the quantitation limit was usually about 0.9-1.0 ug/L (ppb). For prepared blood samples (diluted 1/10), this corresponds to a quantitation limit of 10 ug/L (1 ug/dL). For soft tissues (liver and kidney, diluted 1/10), this corresponds to a quantitation limit of 10 ug/kg (ppb) wet weight, and for bone (final dilution = 1/500) the corresponding quantitation limit is 0.5 ug/g (ppm) ashed weight.

3.0 DATA ANALYSIS

3.1 Overview

Studies on the absorption of lead are often complicated because some biological responses to lead exposure (especially blood lead level) may be non-linear functions of dose (i.e., tending to flatten out or plateau as dose increases). The cause of this non-linearity is uncertain, but might be due to either non-linear absorption and/or to non-linear biological response per unit adsorbed dose. (Preliminary results from this program suggest the non-linear blood lead response is due to due to non-linear lead binding by blood rather than non-linear gastrointestinal absorption). In any event, when the dose-response curve for either the reference material (lead acetate) and/or the test material is non-linear, RBA is equal to the ratio of doses that produce equal responses (not the ratio of responses at equal doses). This is based on the simple but biologically plausible assumption that equal absorbed doses of Pb^{++} yield equal biological responses. Applying this assumption leads to the following general methods for calculating RBA from a set of non-linear experimental data:

1. Plot the biological responses of individual animals exposed to a series of oral doses of soluble lead (e.g., lead acetate). Fit an equation which gives a smooth line through the observed data points.

2. Plot the biological responses of individual animals exposed to a series of doses of test material. Fit an equation which gives a smooth line through the observed data.

3. Using the best fit equations for reference material and test material, calculate RBA as the ratios of doses of test material and reference material which yield equal biological responses. Depending on the relative shape of the best-fit lines through the lead acetate and test material dose response curves, RBA may either be constant (dose-independent) or variable (dose-dependent).

The principal advantage of this approach is that it is not necessary to understand the basis for a non-linear dose response curve (non-linear absorption and/or non-linear biological response) in order to derive valid RBA estimates. Also, it is important to realize that this method is very general, as it will yield correct results even if one or both of the dose-response curves are linear. In the case where both curves are linear, RBA is dose-independent and is simply equal to the ratio of the slopes of the best-fit linear equations.

3.2 Fitting the Curves

There are a number of different mathematical equations which can yield reasonable fits with the dose-response data sets obtained in this study. Conceptually, any equation which gives a smooth fit would be acceptable, since the main purpose is to allow for interpolation of responses between test doses. In selecting which equations to employ, the following principles were applied: 1) mathematically simple equations were preferred over mathematically complex equations, 2) the shape of the curves had to be smooth and biologically realistic, without inflection points, internal maxima or minima, and 3) the general form of the equations had to

be able to fit data not only from this one study, but from all the studies that are part of this project. After testing a wide variety of different equations, it was found that all data sets could be well fitted using one of the following three forms:

Linear (LIN): $\text{Response} = a + b \cdot \text{Dose}$

Exponential (EXP): $\text{Response} = a + c \cdot (1-\exp(-d \cdot \text{Dose}))$

Combination (LIN+EXP): $\text{Response} = a + b \cdot \text{Dose} + c \cdot (1-\exp(-d \cdot \text{Dose}))$

Although underlying mechanism was not considered in selecting these equations, the linear equation allows fitting data that do not show evidence of saturation in either uptake or response, while the exponential and mixed equations allow evaluation of data that appear to reflect some degree of saturation in uptake and/or response.

Each dose-response data set was fit to each of the equations above. If one equation yielded a fit that was clearly superior (as judged by the value of the adjusted correlation coefficient R^2) to the others, that equation was selected. If two or more models fit the data approximately equally well, then the simplest model (that with the fewest parameters) was selected. In the process of finding the best-fits of these equations to the data, the values of the parameters (a, b, c, and d) were subjected to some constraints, and some data points (those that were outside the 95% prediction limits of the fit) were excluded. These constraints and outlier exclusion steps are detailed in Appendix 1 (see Section 3). In general, most blood lead AUC dose-response curves were best fit by the exponential equation, and most dose-response curves for liver, kidney and bone were best fit by linear equations.

3.3 Responses Below Quantitation Limit

In some cases, most or all of the responses in a group of animals were below the quantitation limit for the endpoint being measured. For example, this was normally the case for blood lead values in unexposed animals (both on day -4 and day 0, and in control animals), and also occurred during the early days in the study for animals given test materials with low bioavailability. In these cases, all animals which yielded responses below the quantitation limit were evaluated as if they had responded at one-half the quantitation limit.

3.4 Quality Assurance

Analytical Quality Assurance

A number of steps were taken throughout these studies to evaluate the quality of the results, including blind analysis of numerous duplicate samples (to check reproducability), blind analysis of "check samples" of blood provided by CDCP (to check accuracy), and independent analysis of blood lead values by the CDCP (to check inter-laboratory performance). The results of these analyses are presented in detail in Appendix 1, Section A (Study 7), Section B (Study 8) and Section C (Study 12), and the results are summarized in Table 3-1.

TABLE 3-1 SUMMARY OF QA RESULTS

Category	Parameter	Study Number		
		7	8	12
Correlation of EPA results for duplicate samples of blood	Slope	0.97	0.97	0.96
	R^2	0.99	0.99	0.99
Correlation of EPA results for duplicate samples of bone and tissue	Slope	0.96	1.06	1.16
	R^2	0.99	0.98	0.997
EPA results for CDCP blood lead check samples (ratio of mean of measured to nominal value)	Low Standard	1.07	1.25	0.79
	Medium Standard	0.88	0.73	0.95
	High Standard	0.97	0.94	1.04
Correlation of inter-laboratory analyses of blood (EPA vs CDCP)	Slope	0.74	0.91	0.98
	R^2	0.91	0.99	0.98

As seen, there is generally excellent agreement between duplicates analyses of both blood lead and tissue lead, with best fit slopes and correlation coefficients (R^2) both being near one. Performance on check samples is also generally very good, with the mean ratios (observed/nominal) mainly falling between 0.8 and 1.2. Results of blood samples analyzed by CDCP tend to be slightly lower than those measured by the EPA laboratory, with the slopes of the best fit linear lines through the data of 0.74-0.92. The reason for the apparent difference in results between the EPA laboratory and the CDCP laboratory is not clear, but might be related to differences in sample preparation techniques (CDCP was sent aliquots of whole blood which they prepared and diluted independently). In any event, regardless of the reason, the differences are sufficiently small that they are likely to have no significant effect on calculated RBA values. In particular, it is important to realize that if both the lead acetate and test soils dose-response curves are biased by the same factor, then the biases cancel in the calculation of the RBA.

Data Audits and Spreadsheet Validation

All analytical data generated by EPA's analytical laboratory were validated prior to being released in the form of a database file. These electronic data files were "decoded" (linking the sample tag to the correct animal and day) using Microsoft's database system ACCESS® (Version 5 for Windows). To ensure that no errors occurred in this process, original electronic files were printed out and compared to printouts of the tag assignments and the decoded data.

All spreadsheets used to manipulate the data and to perform calculations (see Appendix 1) were validated by hand-checking random cells for accuracy.

4.0 RESULTS

Detailed raw data for each animal in each of these studies are presented in Appendix 1 (Sections A, B, and C). The following sections provide a summary of the results, focusing on mean results for each dose group investigated.

4.1 Blood Lead vs Time

Figure 4-1 shows the group mean blood lead values as a function of time during the studies. As seen, blood lead values began at or below quantitation limits (about 1 ug/dL) in all groups, and remained at or below quantitation limits in control animals. In animals given repeated oral doses of lead acetate or test material, blood levels began to rise within 1-2 days, and tended to plateau before the end of the study (day 15).

4.2 Dose-Response Patterns

Blood Lead

The measurement endpoint used to quantify the blood lead response was the area under the curve (AUC) for blood lead vs time (days 0-15). AUC was selected because it is the standard pharmacokinetic index of chemical uptake into the blood compartment, and is relatively insensitive to small variations in blood lead level by day. The AUC was calculated using the trapezoidal rule to estimate the AUC between each time point that a blood lead value was measured (days 0, 1, 2, 3, 5, 7, 9, 12, and 15), and summing the areas across all time intervals in the study. The detailed data and calculations are presented in Appendices A to C, and the results are shown graphically in Figure 4-2. Each data point reflects the group mean exposure and group mean response, with the variability in dose and response shown by standard error bars. The figure also shows the best-fit equation through each data set except for the Oregon Gulch sample in Study 12 (where only one dose was administered).

As seen, the dose response pattern is non-linear for both the soluble reference material (lead acetate, abbreviated "PbAc"), and for each of the test materials. Dose response curves for Phase I soil and Fe-Mn-Pb Oxide soil (Panel A) are rather similar to the curve for lead acetate, while the response for AV Slag (panel B) and Oregon Gulch tailings (Panel C) are clearly lower than for lead acetate.

Tissue Lead

The dose-response data for lead levels in bone, liver and kidney (measured at sacrifice on day 15) are detailed in Appendices A to C, and are shown graphically in Figures 4-3 through 4-5, respectively.

As seen, all of these dose response curves for tissues are fit by linear equations. As was the case for the blood lead AUC endpoint, the dose-response curves for Phase I soil and Fe-Mn-Pb Oxide soil (Panel A) are rather similar to the curve for lead acetate, while the response for AV Slag (panel B) and Oregon Gulch tailings (Panel C) are clearly lower than for lead acetate.

FIGURE 4-1 GROUP MEAN BLOOD LEAD BY DAY

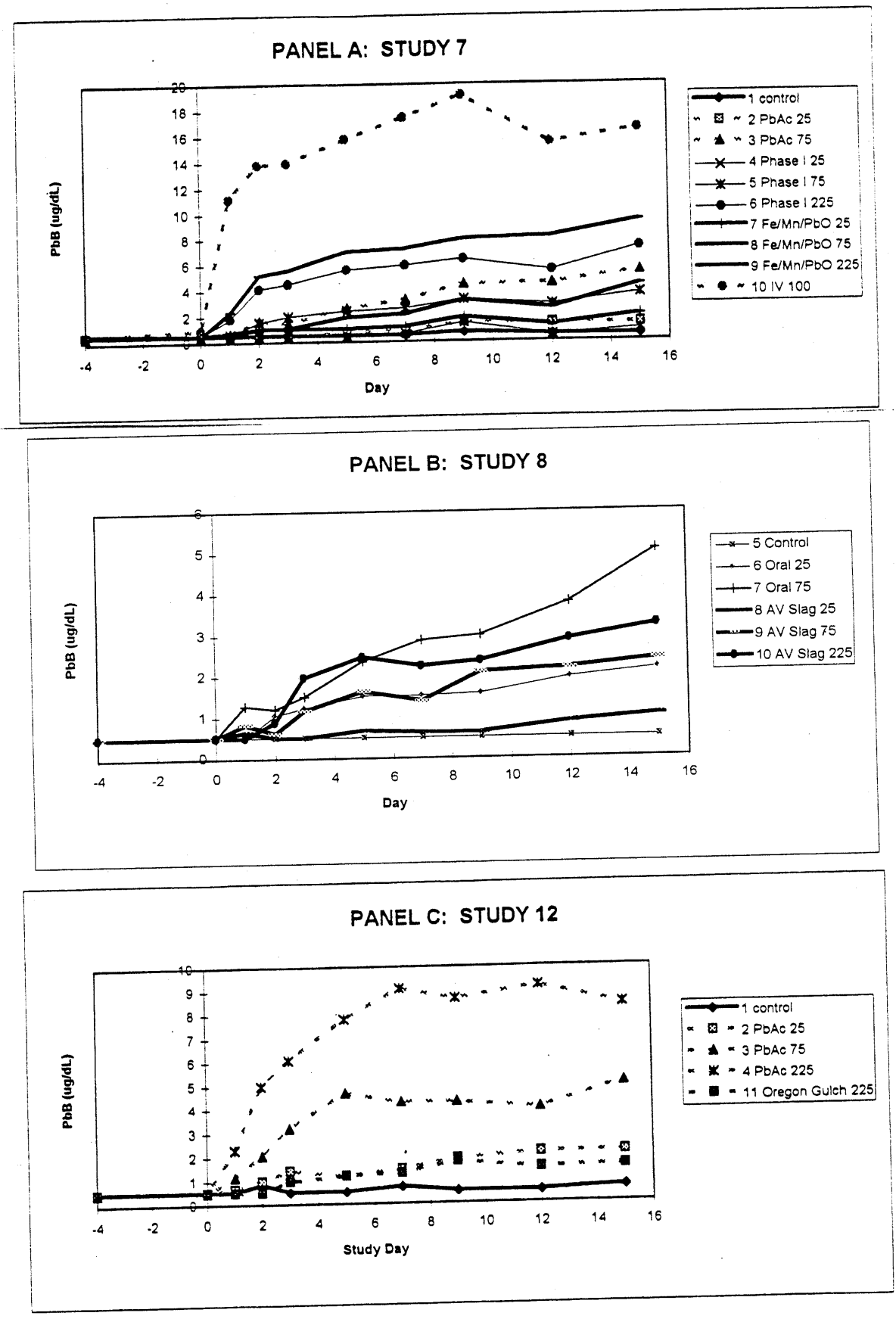
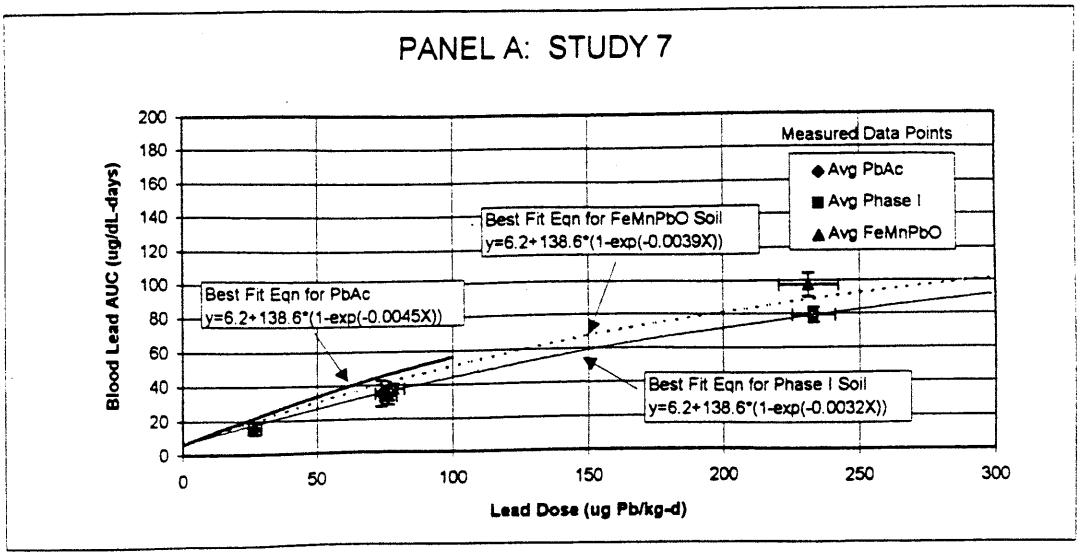
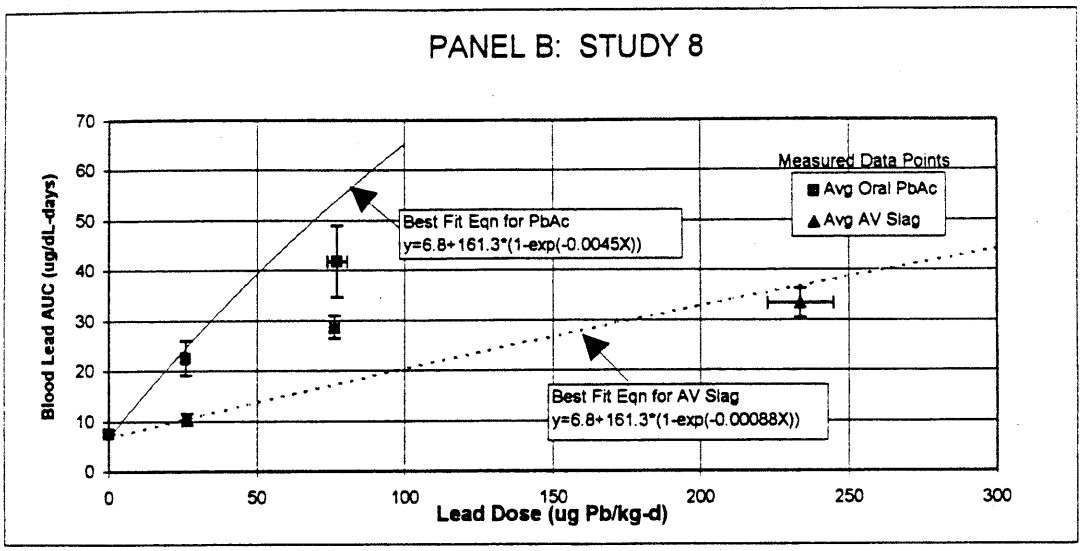


FIGURE 4-2 BLOOD LEAD DOSE-RESPONSE





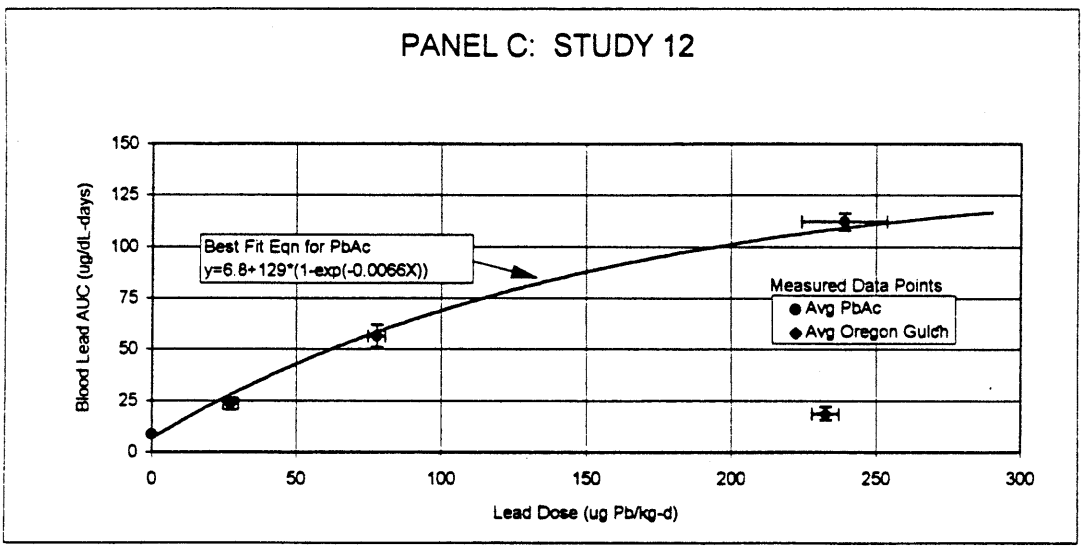


FIGURE 4-3 BONE LEAD DOSE-RESPONSE

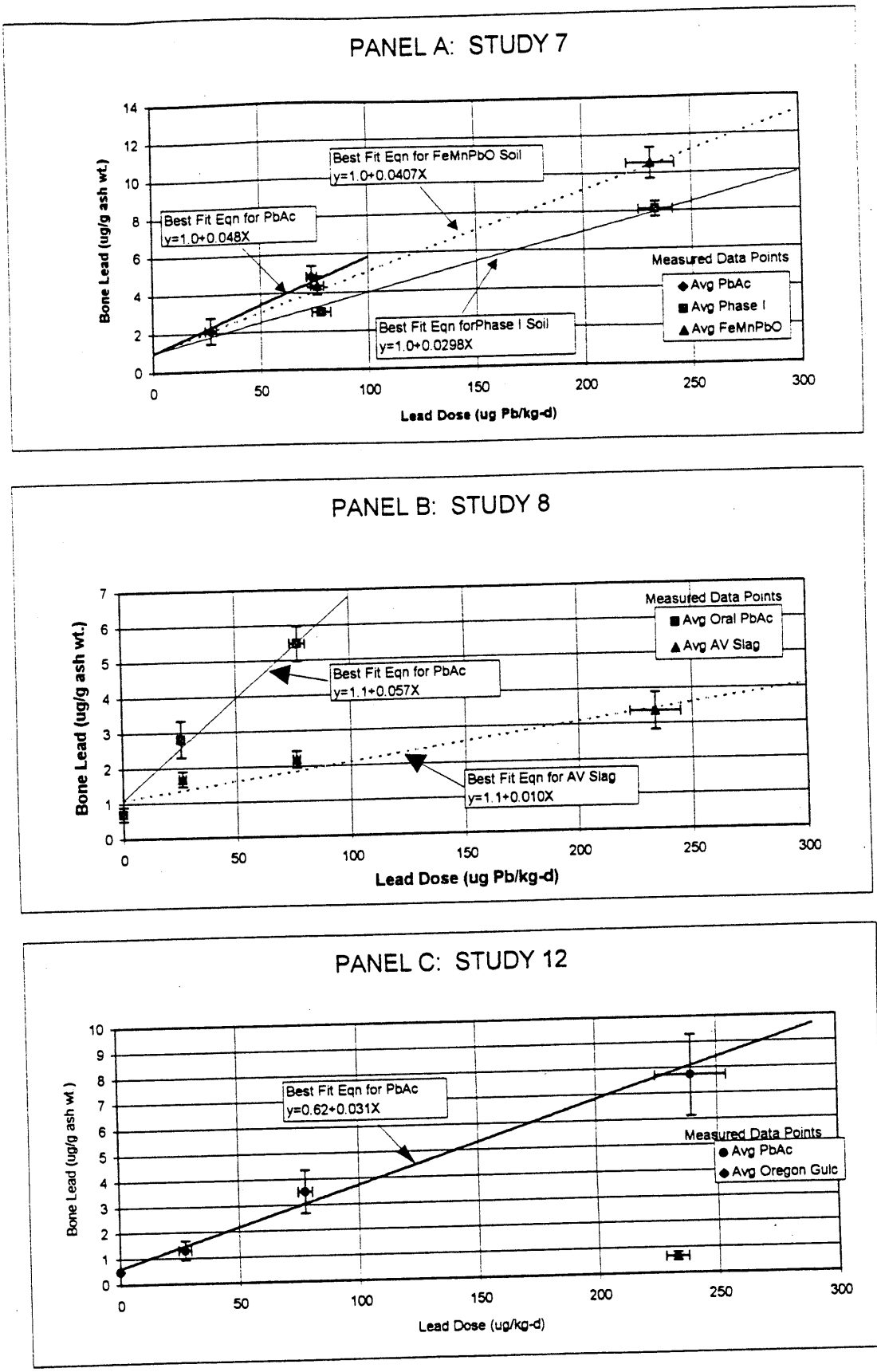
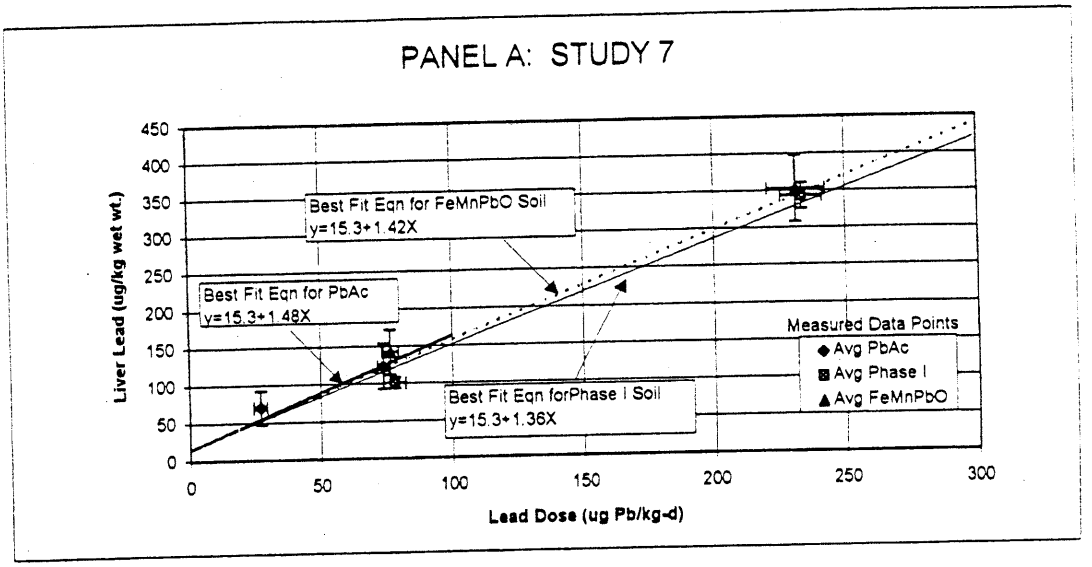
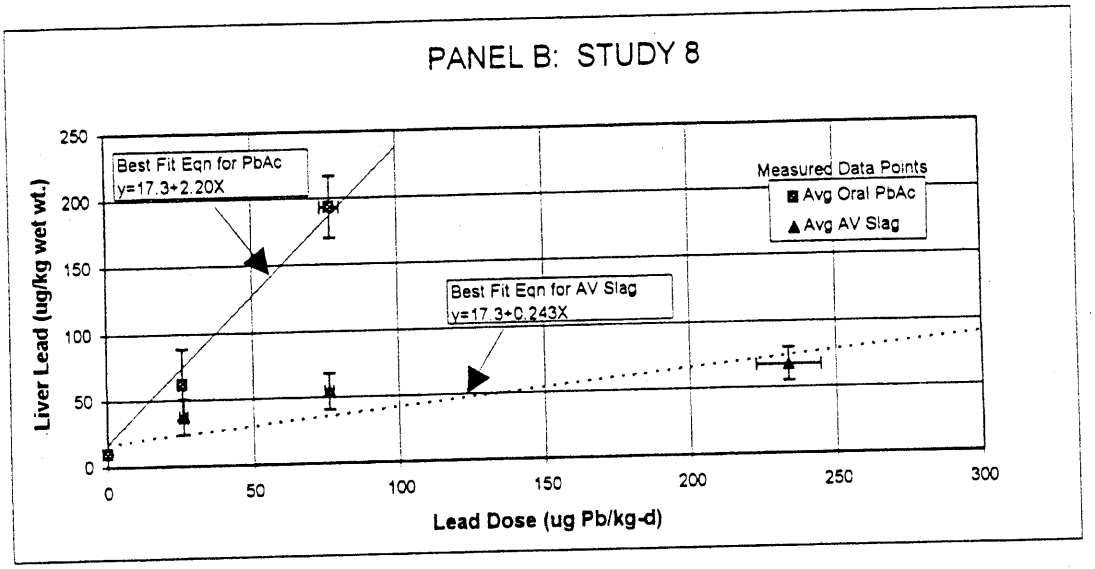


FIGURE 4-4 LIVER LEAD DOSE-RESPONSE





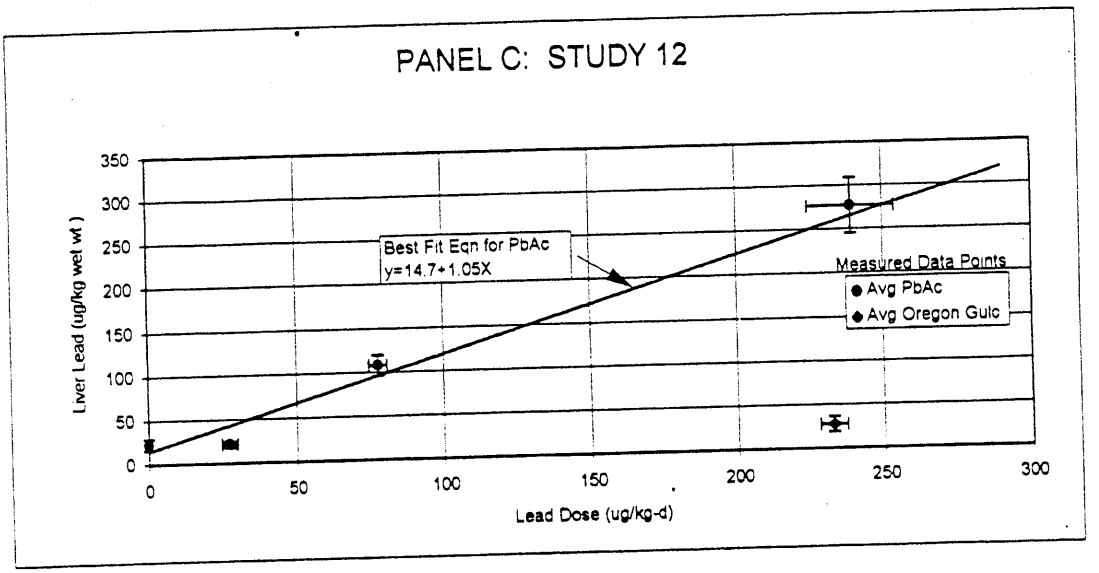
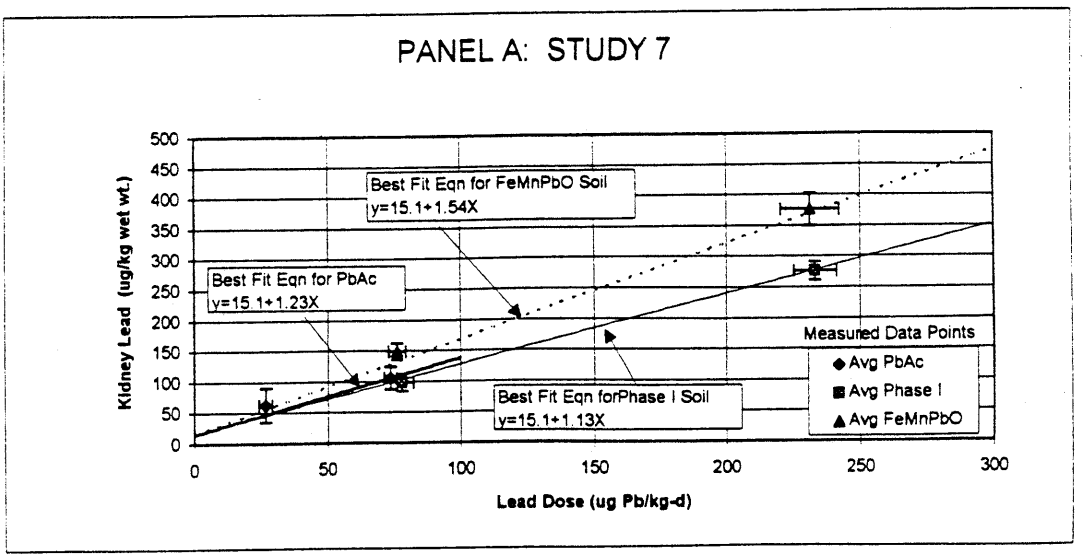
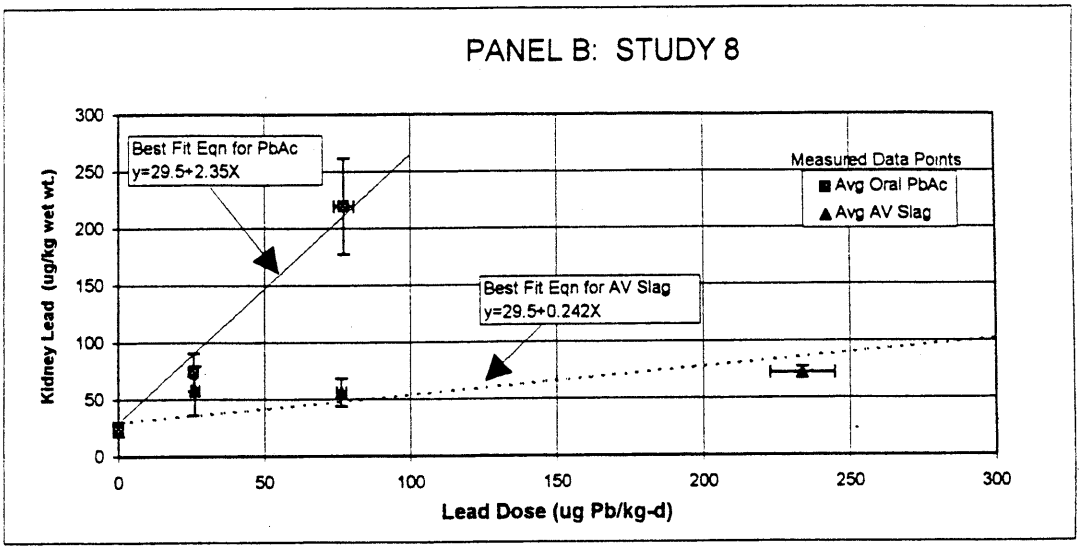
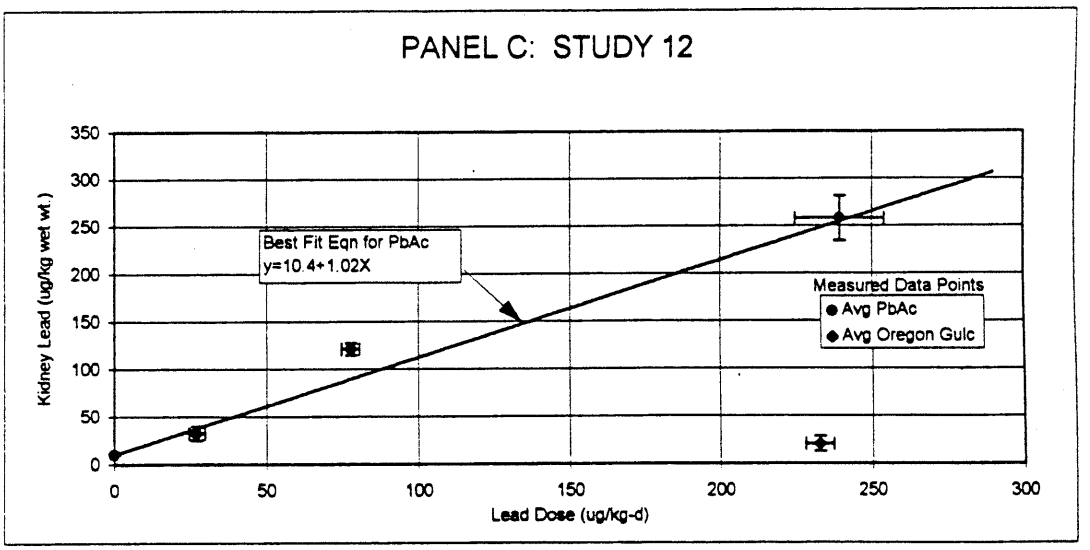


FIGURE 4-5 KIDNEY LEAD DOSE-RESPONSE







4.3 Calculated RBA Values

Relative bioavailability values were calculated for each test material for each measurement endpoint (blood, bone, liver, kidney) using the method described in Section 3.0. The results are shown below:

Measurement Endpoint	Test Material			
	Phase I Composite	Fe-Mn-Pb Oxide	AV Slag	Oregon Gulch
Blood Lead AUC	0.71	0.87	0.20	0.06
Liver Lead	0.92	0.96	0.11	0.05
Kidney Lead	0.91	1.24	0.10	0.04
Bone Lead	0.62	0.84	0.18	0.004

Recommended RBA Values

As shown above, for each test material, there are four independent estimates of RBA (based on blood, liver, kidney, and bone), and the values do not agree in all cases. In general, we recommend greatest emphasis be placed on the RBA estimates derived from the blood lead data. There are several reasons for this recommendation, including the following:

1) Blood lead calculations are based on multiple measurements over time, and so are statistically more robust than the single measurements available for tissue concentrations. Further, blood is a homogeneous medium, and is easier to sample than complex tissues such as liver, kidney and bone. Consequently, the AUC endpoint is less susceptible to random measurement errors, and RBA values calculated from AUC data are less uncertain.

2. Blood is the central compartment and one of the first compartments to be affected by absorbed lead. In contrast, uptake of lead into peripheral compartments (liver, kidney, bone) depends on transfer from blood to the tissue, and may be subject to a variety of toxicokinetic factors that could make bioavailability determinations more complicated.

3. The dose-response curve for blood lead is non-linear, similar to the non-linear dose-response curve observed in children (e.g., see Sherlock and Quinn 1986). Thus, the response of this endpoint is known to behave similarly in swine as in children, and it is not known if the same is true for the tissue endpoints.

4. Blood lead is the classical measurement endpoint for evaluating exposure and health effects in humans, and the health effects of lead are believed to be proportional to blood lead levels.

However, data from the tissue endpoints (liver, kidney, bone) also provide valuable information. We consider the plausible range to extend from the RBA based on blood AUC to the mean of the other three tissues (liver, kidney, bone). The preferred range is the interval from the RBA based on blood to the mean of the blood RBA and the tissue mean RBA. Our suggested point estimate is the mid-point of the preferred range. These values are presented below:

Relative Bioavailability of Lead	Test Material			
	Phase I Composite	Fe-Mn-Pb Oxide	AV Slag	Oregon Gulch
Plausible Range	0.71 - 0.82	0.87 - 1.0	0.13 - 0.20	0.03 - 0.06
Preferred Range	0.71 - 0.76	0.87 - 0.94	0.16 - 0.20	0.05 - 0.06
Suggested Point Estimate	0.74	0.90	0.18	0.06

4.4 Estimated Absolute Bioavailability in Children

These RBA estimates may be used to help assess lead risk at this site by refining the estimate of absolute bioavailability (ABA) of lead in soil and other similar solid media (slag, tailings), as follows:

$$ABA_{medium\ x} = ABA_{soluble} \cdot RBA_{medium\ x}$$

Available data indicate that fully soluble forms of lead are about 50% absorbed by a child (USEPA 1991, 1994). Thus, the estimated absolute bioavailability of lead in soil-like site media are calculated as follows:

$$ABA_{medium\ x} = 50\% \cdot RBA_{medium\ x}$$

Based on the RBA values shown above, the estimated absolute bioavailabilities in children for the four site media tested at this site are as follows:

Absolute Bioavailability of Lead	Test Material			
	Phase I Composite	Fe-Mn-Pb Oxide	AV Slag	Oregon Gulch
Plausible Range	36%-41%	43%-51%	6%-10%	2%-3%
Preferred Range	36%-38%	43%-47%	8%-10%	2%-3%
Suggested Point Estimate	**37%**	**45%**	**9%**	**3%**

4.5 Uncertainty

These absolute bioavailability estimates are appropriate for use in EPA's IEUBK model for this site, although it is clear that there is both variability and uncertainty associated with these estimates. This variability and uncertainty arises from several sources. First, differences in physiological and pharmacokinetic parameters between individual animals leads to variability in

response even when exposure is the same. Because of this inter-animal variability in the responses of different animals to lead exposure, there is mathematical uncertainty in the best fit dose-response curves for both lead acetate and test material. This in turn leads to uncertainty in the calculated values of RBA, because these are derived from the two best-fit equations. Second, there is uncertainty in how to weight the RBA values based on the different endpoints, and how to select a point estimate for RBA that is applicable to typical site-specific exposure levels. Third, there is uncertainty in the extrapolation of measured RBA values in swine to young children. Even though the immature swine is believed to be a useful and meaningful animal model for gastrointestinal absorption in children, it is possible that differences in stomach pH, stomach emptying time, and other physiological parameters may exist and that RBA values in swine may not be precisely equal to values in children. Finally, studies in humans reveal that lead absorption is not constant even within an individual, but varies as a function of many factors (mineral intake, health status, etc.). One factor that may be of special importance is time after the last meal, with the presence of food tending to reduce lead absorption. The values of RBA measured in this study are intended to estimate the maximum uptake that occurs when lead is ingested in the absence of food. Thus, these values may be somewhat conservative for children who ingest lead along with food. The magnitude of this bias is not known, although preliminary studies in swine suggest the factor may be relatively minor.

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APPENDIX 1

DETAILED DATA AND CALCULATIONS FOR USEPA SWINE BIOAVAILABILITY STUDY PHASE II, EXPERIMENTS 7, 8 and 12

CALIFORNIA GULCH NPL SITE

TEST MATERIALS

Phase I Residential Soil Composite
Fe-Mn-Pb Oxide Soil
AV Smelter Slag sample
Oregon Gulch Tailings Sample

APPENDIX 1

DETAILED DATA SUMMARY
CALIFORNIA GULCH SITE SAMPLES

1.0 OVERVIEW

Performance of the three studies covered in this report involved collection and reduction of a large number of data items. All of these data items and all of the data reduction steps are contained in Microsoft Excel spreadsheets that are available upon request from the administrative record. These files are intended to allow detailed review and evaluation by outside parties of all aspects of each study.

This Appendix provides detailed descriptions of the data reduction steps, along with printouts of selected tables and graphs from the XLS files, organized into three sections, as follows:

Section	Study	Test Materials
A	7	Phase I Residential Composite Soil Fe-Mn-Pb Oxide Soil
B	8	AV Slag
C	12	Oregon Gulch Tailings

Any additional details of interest to a reader can be found in the XLS spreadsheets.

2.0 RAW DATA AND DATA REDUCTION STEPS

2.1 Body Weights and Dose Calculations

Animals were weighed on day -1 (one day before exposure) and every three days thereafter during the course of the study. Doses of lead for the three days following each weighing were based on the group mean body weight, adjusted by addition of 1 kg to account for the expected weight gain over the interval. After completion of the experiment, body weights were estimated by interpolation for those days when measurements were not collected, and the actual administered doses (ug Pb/kg) were calculated for each day and then averaged across all days. If an animal missed a dose or was given an incorrect dose, the calculation of average dose corrected for these factors. These data and data reduction steps are shown in Tables 1 and 2 of Sections A, B, and C. Doses which required adjustment are shown by a heavy black box outlining the value in Table 1 in each section.

2.2 Blood Lead vs Time

Blood lead values were measured in each animal on days -4, 0, 1, 2, 3, 5, 7, 9, 12, and 15. The raw laboratory data (reported as ug/L of diluted blood) are shown in Table 3 of Sections A, B, and C. These data were adjusted as follows: a) non-detects were evaluated by assuming a value equal to one-half the quantitation limit, and b) the concentrations in diluted blood were converted to units of ug/dL in whole blood by dividing by a factor of 1 dL of blood per L of diluted sample. The results are shown in the right-hand column of Table 3 in each section. Figures 1 to 3 in each section plot the results for individual animals organized by group and by day. Figure 4 of each section plots the mean blood lead value for each dosing group by day.

After adjustment as above, values that were more than a factor of 1.5 above or below the group mean for any given day were "flagged" by computer as potential outliers. These values are shown in each section in Table 4 by cells that are shaded gray. Each data point identified in this way was reviewed and professional judgment was used to decide if the value should be retained or excluded. In order to avoid inappropriate biases, blood lead outlier designations were restricted to values that were clearly aberrant from a time-course and/or dose-response perspective. In this study, none of the flagged values were excluded in study 8 or 12 (Tables B-5 and C-5), and two values were excluded in study 7 (Table A-5).

2.3 Blood Lead AUC

The area under the blood lead vs time curve for each animal was calculated by finding the area under the curve for each time step using the trapezoidal rule:

$$AUC(d_i \text{ to } d_j) = 0.5*(r_i+r_j)*(d_j-d_i)$$

where:

d = day number
r = response (blood lead value) on day i (r_i) or day j (r_j)

The areas were then summed for each of the time intervals to yield the final AUC for each animal. These calculations are shown in Table 6 in each section. If a blood lead value was missing (either because of problems with sample preparation, or because the measured value was excluded as an outlier), the blood lead value for that day was estimated by linear interpolation.

2.4 Liver, Kidney and Bone Lead Data

At sacrifice (day 15), samples of liver, kidney and bone (femur) were removed and analyzed for lead. The raw data (expressed as ug Pb/L of prepared sample) are summarized in Table A-7. These data were adjusted as follows: a) non-detects were evaluated by assuming a value equal to one-half the quantitation limit, and b) the concentrations in prepared sample were converted to units of concentration in the original biological sample by dividing by the following factors:

Liver:	0.1 kg wet weight/L prepared sample
Kidney:	0.1 kg wet weight/L prepared sample

Bone: 2 gm ashed weight/L prepared sample

The resulting values are shown in the right-hand column of Table 7 in each section.

3.0 CURVE FITTING

Basic Equations

A commercial curve-fitting program (Table Curve-2D™ Version 2.0 for Windows, available from Jandel Scientific) was used to derive best fit equations for each of the individual dose-response data sets derived above. A least squares regression method was used for both linear and non-linear equations. As discussed in the text, three different user-defined equations were fit to each data set:

Linear (LIN): $\text{Response} = a + b \cdot \text{Dose}$

Exponential (EXP): $\text{Response} = a + c \cdot (1-\exp(-d \cdot \text{Dose}))$

Combination (LIN+EXP): $\text{Response} = a + b \cdot \text{Dose} + c \cdot (1-\exp(-d \cdot \text{Dose}))$

Constraints

In the process of finding the best-fits of these equations to the data, the values of the parameters (a, b, c, and d) were constrained as follows:

- Parameter "a" (the intercept, equal to the baseline or control value of the measurement endpoint) was constrained to be non-negative and was forced in all cases to be the same for the reference material (lead acetate) and the test materials. This is because, by definition, all dose-response curves for groups of animals exposed to different materials must arise from the same value at zero dose. In addition, for blood lead data, "a" was constrained to be equal to the mean of the control group $\pm$ 20% (typically 7.5 $\pm$ 1.5 AUC units).

- Parameter "b" (the slope of the linear dose-response line) was constrained to non-negative values, since all of the measurement endpoints evaluated are observed to increase, not decrease, as a function of lead exposure.

- Parameter "c" (the plateau value of the exponential curve) was constrained to be non-negative, and was forced to be the same for the reference material (lead acetate) and the test material. This is because: 1) it is expected on theoretical grounds that the plateau (saturation level) should be the same regardless of the source of lead, and 2) curve-fitting of individual curves tended to yield values of "c" that were close to each other and were not statistically different.

- Parameter "d" (which determines where the "bend" in the exponential equation occurs) was constrained to be greater than 0.0045 for the lead acetate blood lead (AUC) dose-response curve. This constraint was judged to be necessary because the weight of evidence from all studies clearly showed the lead acetate blood lead dose response curve was non-linear and was best fit by an exponential equation, but in some studies there were only two low doses of lead acetate used to define the dose-response curve, and this narrow range data set could sometimes be fit nearly as well by a linear as an exponential curve. The choice of the constraint on "d" was selected to be slightly lower than the observed best-fit value of "d" (0.006) when data from all lead acetate AUC dose-response curves from all of the different studies in this program were used. This approach may tend to underestimate relative bioavailability slightly in some studies (especially at low doses), but use of the information gained from all studies is judged to be more robust than basing fits solely on the data from one study.

In general, one of these models (the linear, the exponential, or the combination) usually yielded a fit (as judged by the value of the adjusted correlation coefficient R^2 and by visual inspection of the fit of the line through the measured data points) that was clearly superior to the others. If two or more models fit the data approximately equally well, then the simplest model (that with the fewest parameters) was selected.

Outlier Identification

During the dose-response curve fitting process for each study, all data were carefully reviewed to identify any anomalous values. Typically, the process used to identify outliers was as follows:

Step 1 — Any data points judged to be outliers based on information derived from analysis of data across multiple studies (as opposed to conclusions drawn from within the study) were excluded.

Step 2 — The remaining raw data points were fit to the equation judged to be the most likely to be the best fit (linear, exponential, or mixed). Table Curve 2-D was then used to plot the 95% prediction limits around the best fit line. All data points that fell outside the 95% prediction limits were considered to be outliers and were excluded.

Step 3 — After excluding these points (if any), a new best-fit was obtained. In some cases, data points originally inside the 95% prediction limits were now outside the limits. However, further iterative cycles of data point exclusion were not performed, and the fit was considered final.

It should be noted that professional judgment can be imposed during any stage of the above outlier identification process. In this study, one additional data point was determined to be an outlier and excluded from analysis.

Curve Fit Results

For each section, Table 8 lists the data used to fit these curves, indicating which endpoints were excluded as outliers and why, and Table 9 shows the type of equation selected to fit each data set, and the best fit parameters. The resulting best-fit equations for the data sets are shown in Figures 7 and greater, found at the end of each section. Values excluded as outliers are represented in the figures by the symbol "+".

4.0 RESULTS -- CALCULATED RBA VALUES

The value of RBA for a test substance was calculated for a series of doses using the following procedure:

1. For each dose, calculate the expected response to test material, using the best fit equation through the dose-response data for that material.

2. For each expected response to test material, calculate the dose of lead acetate that is expected to yield an equivalent response. This is done by "inverting" the dose-response curve for lead acetate, solving for the dose that corresponds to a specified response.

3. Calculate RBA at that dose as the ratio of the dose of lead acetate to the dose of test material. For the situation where both curves are linear, the value of RBA is the ratio of the slopes (the "b" parameters). In the case where both curves are exponential and where both curves have the same values for parameters "a" and "c", the value of RBA is equal to the ratio of the "d" parameters.

The results are summarized in Table 10 in each section.

5.0 QUALITY ASSURANCE DATA

A number of steps were taken throughout the studies in this project to ensure the quality of the results, including 5% duplicates, 5% standards, a program of interlaboratory comparison. These steps are detailed below, with figures and tables presented in Sections A, B, and C.

Duplicates

Duplicate samples were prepared and analyzed for about 5% of all samples generated during the study. In each section, Table 11 lists the first and second values for blood, liver, kidney, and bone. The results are shown in Figure 5 of each section.

Standards

The Centers for Disease Control and Prevention (CDCP) provide a variety of blood lead "check samples" for use in quality assurance programs for blood lead studies. Each time a group of blood samples was prepared and sent to the laboratory for analysis, several CDCP check samples of different concentrations were included. In each section, Table 12 lists the concentrations

reported by the laboratory compared to the nominal concentrations indicated by CDCP for the samples submitted during this study, and the results are plotted in Figure 6.

Interlaboratory Comparison

An interlaboratory comparison of blood lead analytical results was performed by sending a set of 15 randomly selected whole blood samples from this study to CDCP for independent analysis. In each section, the data are presented in Table 13, and the results are plotted in Figure 6.

SECTION A

STUDY 7

Phase I Residential Soil Composite
FeMePb Oxide

TABLE A-1 BODY WEIGHTS AND ADMINISTERED DOSES, BY DAY*

Body weights were measured on days -1, 2, 5, 8, 11, 14. Weights for other days are estimated, based on linear interpolation between measured values.

Group	ID #	Day -1		Day 0		Day 1		Day 2		Day 3		Day 4		Day 5		Day 6		Day 7		Day 8		Day 9		Day 10		Day 11		Day 12		Day 13		Day 14		Day 15	
		BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day
1	706	11.6	0	12.0	0	12.4	0	12.84	0	13.3	0	13.7	0	14.1	0	14.5	0	14.9	0	15.24	0	15.7	0	16.2	0	16.74	0	16.7	0	16.7	0	16.66	0	16.6	0
1	714	8.8	0	9.1	0	9.4	0	9.74	0	9.9	0	10.1	0	10.32	0	10.6	0	10.8	0	11.04	0	11.4	0	11.8	0	12.14	0	12.6	0	13.1	0	13.62	0	14.1	0
1	718	9	0	9.2	0	9.4	0	9.64	0	10.1	0	10.7	0	11.16	0	11.6	0	12.0	0	12.48	0	12.9	0	13.2	0	13.6	0	14.1	0	14.5	0	15	0	15.5	0
1	735	10.5	0	10.9	0	11.3	0	11.7	0	11.9	0	12.0	0	12.22	0	12.8	0	13.4	0	13.96	0	14.6	0	15.3	0	15.92	0	16.6	0	17.2	0	17.82	0	18.5	0
1	743	9.9	0	10.2	0	10.5	0	10.78	0	10.6	0	10.5	0	10.34	0	11.0	0	11.6	0	12.3	0	12.9	0	13.5	0	14.04	0	14.7	0	15.3	0	15.92	0	16.5	0
2	703	8.8	0	9.1	280	9.4	280	9.76	280	10.1	303	10.4	303	10.74	303	10.9	315	11.0	315	11.16	315	11.0	339	10.8	339	10.62	339	11.3	346	12.0	346	12.64	346	13.3	0
2	709	8.6	0	8.7	280	8.9	280	9	280	8.9	303	8.7	303	8.56	303	8.6	315	8.7	315	8.8	315	8.9	339	8.9	339	8.98	339	9.4	346	9.7	346	10.12	346	10.5	0
2	748	10.9	0	11.2	280	11.4	280	11.72	280	12.0	303	12.2	303	12.44	303	12.9	315	13.4	315	13.82	315	13.9	339	14.0	339	14.08	339	14.9	346	15.7	346	16.56	346	17.4	0
2	750	11.5	0	11.9	280	12.3	280	12.72	280	13.0	303	13.4	303	13.7	303	14.2	315	14.7	315	15.26	315	15.5	339	15.7	339	15.86	339	16.6	346	17.4	346	18.2	346	19.0	0
2	755	11.1	0	11.5	280	12.0	280	12.38	280	12.4	303	12.5	303	12.58	303	13.0	315	13.4	315	13.76	315	14.1	339	14.4	339	14.66	339	15.2	346	15.8	346	16.35	346	16.9	0
3	711	10.8	0	11.3	839	11.7	839	12.2	839	12.7	909	13.2	909	13.68	909	13.8	945	14.0	945	14.18	945	14.2	1017	14.3	1017	14.34	1017	15.0	1038	15.7	1038	16.38	1038	17.1	0
3	715	9	0	9.7	839	10.3	839	10.98	839	11.1	909	11.2	909	11.36	909	11.7	945	12.1	945	12.4	945	12.6	1017	12.8	1017	13.02	1017	13.5	1038	14.0	1038	14.52	1038	15.0	0
3	716	10.7	0	11.1	839	11.5	839	11.92	839	12.3	909	12.7	909	13.12	909	13.7	945	14.3	945	14.96	945	15.2	1017	15.3	1017	15.54	1017	16.2	1038	16.9	1038	17.52	1038	18.2	0
3	747	9.4	0	9.7	839	10.0	839	10.36	839	10.8	909	11.3	909	11.72	909	12.1	945	12.5	945	12.82	945	13.0	1017	13.1	1017	13.28	1017	14.1	1038	15.0	1038	15.84	1038	16.7	0
3	731	9.8	0	10.2	839	10.6	839	11	839	11.3	909	11.6	909	11.86	909	12.3	945	12.7	945	13.16	945	13.3	1017	13.5	1017	13.62	1017	14.4	1038	15.2	1038	16.02	1038	16.8	0
4	704	8.6	0	9.0	282	9.3	282	9.66	282	9.8	298	9.9	298	10.02	298	10.4	314	10.8	314	11.16	314	11.2	340	11.2	340	11.16	340	12.0	346	12.9	346	13.82	346	14.7	0
4	712	10.4	0	10.6	282	10.7	282	10.92	282	11.0	298	11.2	298	11.28	298	11.8	314	12.4	314	12.96	314	13.1	340	13.3	340	13.48	340	14.4	346	15.3	346	16.22	346	17.1	0
4	736	12.2	0	12.3	282	12.5	282	12.6	282	12.8	298	13.1	298	13.28	298	13.4	314	13.5	314	13.56	314	13.6	340	13.7	340	13.8	340	14.7	346	15.5	346	16.38	346	17.2	0
4	740	9.1	0	9.2	282	9.3	282	9.38	282	9.7	298	10.1	298	10.44	298	10.8	314	11.2	314	11.58	314	11.7	340	11.7	340	11.82	340	12.4	346	12.9	346	13.48	346	14.0	0
4	753	11	0	11.3	282	11.7	282	12.02	282	12.3	298	12.5	298	12.76	298	13.1	314	13.4	314	13.76	314	13.8	340	13.9	340	13.9	340	14.4	346	14.9	346	15.44	346	16.0	0
5	702	8.3	0	8.5	842	8.7	842	8.96	842	9.4	905	9.7	905	10.14	905	10.5	960	10.9	960	11.3	960	11.7	1009	12.0	1009	12.36	1009	13.1	1073	13.9	1073	14.72	1073	15.5	0
5	708	11.3	0	11.5	842	11.8	842	12.02	842	12.2	905	12.4	905	12.62	905	12.8	960	12.7	960	12.68	960	13.0	1009	13.3	1009	13.58	1009	14.3	1073	15.0	1073	15.74	1073	16.5	0
5	728	12.1	0	12.4	842	12.6	842	12.92	842	13.2	905	13.5	905	13.72	905	13.9	960	14.1	960	14.3	960	14.6	1009	14.9	1009	15.18	1009	15.9	1073	16.7	1073	17.48	1073	18.2	0
5	739	8.9	0	9.2	842	9.4	842	9.66	842	9.9	905	10.0	905	10.24	905	10.5	960	10.7	960	10.92	960	11.1	1009	11.2	1009	11.34	1009	12.2	1073	13.1	1073	14.04	1073	14.9	0
5	756	10.5	0	10.9	842	11.4	842	11.8	842	12.0	905	12.1	905	12.3	905	12.6	960	12.8	960	13.06	960	13.4	1009	13.7	1009	14.06	1009	14.8	1073	15.5	1073	16.26	1073	17.0	0
6	717	11.4	0	11.5	2556	11.5	2556	11.6	2556	11.8	2661	12.1	1331	12.32	3992	12.5	2900	12.7	2900	12.9	1450	13.5	4531	14.0	3081	14.62	3081	14.7	3365	14.8	3365	14.9	3365	15.0	0
6	723	10.2	0	10.2	2556	10.3	2556	10.32	2556	10.7	2661	11.1	2661	11.46	2661	11.8	2900	12.2	2900	12.56	2900	12.7	3081	12.8	3081	12.98	3081	13.5	3365	14.1	3365	14.64	3365	15.2	0
6	725	12	0	12.0	2556	12.1	2556	12.14	2556	12.4	2661	12.6	2661	12.82	2661	13.2	2900	13.6	2900	13.92	2900	14.6	3081	15.3	3081	16	3081	16.2	3365	16.4	3365	16.54	3365	16.7	0
6	732	9.5	0	9.7	2556	10.0	2556	10.22	2556	10.6	2661	11.0	2661	11.38	2661	11.8	2900	12.3	2900	12.7	2900	13.1	3081	13.4	3081	13.76	3081	14.3	3365	14.8	3365	15.38	3365	15.9	0
6	737	8.7	0	9.1	2556	9.5	2556	9.86	2556	10.4	2661	10.9	2661	11.46	2661	11.4	2900	11.4	2900	11.38	2900	11.7	3081	12.1	3081	12.42	3081	12.9	3365	13.4	3365	13.96	3365	14.5	0
7	707	9.3	0	9.8	268	10.3	268	10.74	268	11.1	296	11.4	296	11.72	296	12.2	325	12.8	325	13.28	325	13.6	352	13.9	352	14.2	352	15.1	381	15.9	381	16.8	381	17.7	0
7	713	9.4	0	9.8	268	10.2	268	10.58	268	11.1	296	11.6	296	12.06	296	12.3	325	12.6	325	12.86	325	13.4	352	13.9	352	14.38	352	15.0	381	15.7	381	16.36	381	17.0	0
7	730	9.5	0	9.8	268	10.2	268	10.52	268	11.0	296	11.6	296	12.08	296	12.3	325	12.6	325	12.82	325	13.2	352	13.7	352	14.1	352	14.8	381	15.4	381	16.08	381	16.7	0
7	738	11.3	0	11.5	268	11.7	268	11.92	268	12.2	296	12.5	296	12.74	296	13.1	325	13.5	325	13.82	325	14.0	352	14.3	352	14.48	352	15.3	381	16.2	381	17.02	381	17.9	0
7	741	9.1	0	9.5	268	10.0	268	10.4	268	10.7	296	11.0	296	11.32	296	11.7	325	12.2	325	12.58	325	13.0	352	13.5	352	13.94	352	14.6	381	15.3	381	16.02	381	16.7	0
8	733	10	0	10.5	848	11.0	848	11.46	848	11.9	936	12.3	936	12.66	936	13.2	1036	13.7	1036	14.26	1036	14.5	1134	14.8	1134	15.08	1134	16.1	1187	17.1	1187	18.14	1187	19.2	0
8	742	8.6	0	9.1	848	9.6	848	10.1	848	10.5	936	11.0	936	11.44	936	11.7	1036	12.0	1036	12.34	1036	12.5	1134	12.7	1134	12.92	1134	13.6	1187	14.3	1187	14.92	1187	15.6	0
8	746	10.2	0	10.3	848	10.5	848	10.58	848	11.2	936	11.8	936	12.38	936	12.9	1036	13.4	1036	13.98	1036	14.1	1134	14.1	1134	14.2	1134	14.6	1187	15.0	1187	15.34	1187	15.7	0
8	749	11.2	0	11.6	848	12.1	848	12.5	848	12.8	936	13.0	936	13.28	936	13.8	1036	14.3	1036	14.74	1036	15.0	1134	15.4	1134	15.66	1134	16.6	1187	17.4	1187	18.34	1187	19.2	0
8	751	11.5	0	11.9	848	12.3	848	12.76	848	13.3	936	13.8	936	14.3	936	14.6	1036	15.0	1036	15.3	1036	15.6	1134	16.0	1134	16.3	1134	17.0	1187	17.8	1187	18.52	1187	19.3	0
9	719	10.6	0	11.1	2543	11.5	2543	11.98	2543	12.3	1363	12.7	4088	13.02	2725	13.3	2970	13.5	2970	13.76	2970	14.3	3127	14.7	3127	15.24	3127	15.9	3493	16.5	3493	17.2	3493	17.9	0
9	721	10.1	0	10.3	2543	10.5	2543	10.7	2543	11.1	2725	11.4	2725	11.8	2725	11.9	2970	12.0	2970	12.16	2970	12.9	3127	13.6	3127	14.26	3127	14.8	3493	15.3	3493	15.84	3493	16.4	0
9	729	12.3	0	12.5	2543	12.8	2543	13	2543	13.4	2725	13.8	2725	14.22	2725	14.4	2970	14.6	2970	14.8	2970	15.3	3127	15.9	3127	16.4	3127	16.9	3493	17.5	3493	18	3493	18.5	0
9	744	9.2	0	9.6	2543	10.1	2543	10.54	2543	10.9	2725	11.2	2725	11.48	2725	11.8	2970	12.1	2970	12.36	2970	12.9	3127	13.5	3127	14.04	3127	14.7	3493	15.3	3493	15.98	3493	16.6	0
9	745	9.3	0	9.3	2543	9.3	2543	9.34	2543	9.7	2725	10.1	2725	10.48	2725	10.8	2970	11.1	2970	11.4	2970	11.8	3127	12.3	3127	12.68	3127	13.3	3493	14.0	3493	14.62	3493	15.3	0
10	722	12.4	0	12.6	1172	12.9	1172	13.08	1172	13.4	1286	13.7	1286	14.08	1286	14.5	1371	14.8	1371	15.22	1371	15.7	1463	16.1	1463	16.58	1463	17.3	1566	18.0	1566	18.7	1566	19.4	0
10	724	7.8	0	8.2	1172	8.5	1172	8.86	1172	9.2	1286	9.6	1286	10.02	1286	10.1	1371	10.2	1371	10.34	1371	11.0	1463	11.7	1463	12.44	1463	12.8	1566	13.2	1566	13.62	1566	14.0	0
10	727	11	0	11.7	1172	12.3	1172	12.96	1172	13.4	1286	13.8	1286	14.16	1286	14.5	1371	14.9	1371	15.24	1371	15.6	1463	15.9	1463	16.22	1463	16.7	1566	17.2	1566	17.7	1566	18.2	0
10	734	10.4	0	10.7	1172	11.0	1172	11.28	1172	11.5	1286	11.7	1286	11.88	1286	12.5	1371	13.1	1371	13.64	1371	13.7	1463	13.8	1463	13.82	1463	14.1	1566	14.3	1566	14.56	1566	14.8	0
10	754	12	0	12.4	1172	12.8	1172	13.14	1172	13.2	1286	13.3	1286	13.4	1286	13.5	1371	13.6	1371	13.7	1371	13.9	1463	14.1	1463	14.24	1463	15.0	1566	15.7	1566	16.48	1566	17.2	0

Pig 717 failed to consume its evening dose on days 4 and 8. These doses were consumed the next morning and are adjusted for in the calculations
Pig 719 failed to consume its evening dose on day 3. This dose was consumed the next morning and is adjusted for in the calculations

TABLE A-2

Body Weight Adjusted Doses

(Dose for Day/BW for Day)

Group	ID #	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11	Day 12	Day 13	Day 14	Avg Dose	Target Dose	% Target	Avg %
1	706	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0		
1	714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0		
1	718	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0		
1	735	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0		
1	743	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0		
2	703	30.6	29.6	28.6	30.0	29.1	28.2	29.0	28.6	28.2	30.9	31.4	31.9	30.6	28.9	27.4	29.5	25	118	
2	709	32.0	31.5	31.1	34.2	34.8	35.4	36.5	36.1	35.8	38.3	38.0	37.8	37.0	35.5	34.2	35.2	25	141	
2	748	25.0	24.4	23.8	25.3	24.8	24.3	24.4	23.6	22.8	24.4	24.2	24.1	23.2	22.0	20.9	23.8	25	95	
2	750	23.5	22.7	22.0	23.2	22.6	22.1	22.2	21.4	20.6	21.9	21.6	21.4	20.8	19.9	19.0	21.7	25	87	
2	755	24.2	23.4	22.6	24.3	24.2	24.1	24.3	23.6	22.9	24.1	23.6	23.1	22.7	21.9	21.2	23.3	25	93	107
3	711	74.4	71.5	68.7	71.6	68.9	66.4	68.3	67.5	66.7	71.5	71.2	70.9	69.1	66.1	63.4	69.1	75	92	
3	715	86.8	81.3	76.4	81.8	80.9	80.0	80.7	78.4	76.2	80.7	79.4	78.1	76.8	74.0	71.5	78.9	75	105	
3	716	75.5	72.8	70.3	73.8	71.4	69.3	68.8	65.9	63.2	67.1	66.3	65.4	64.1	61.6	59.2	67.6	75	90	
3	747	86.3	83.5	80.9	84.0	80.7	77.5	78.2	75.9	73.7	78.4	77.5	76.6	73.4	69.3	65.5	77.4	75	103	
3	731	82.2	79.1	76.2	80.5	78.5	76.6	76.9	74.3	71.8	76.4	75.5	74.7	72.0	68.2	64.8	75.2	75	100	98
4	704	31.4	30.2	29.1	30.5	30.1	29.7	30.2	29.1	28.1	30.5	30.5	30.5	28.7	26.7	25.0	29.4	25	117	
4	712	26.6	26.2	25.8	27.0	26.7	26.4	26.5	25.3	24.2	25.9	25.6	25.2	24.0	22.6	21.3	25.3	25	101	
4	736	22.8	22.6	22.3	23.2	22.8	22.4	23.5	23.3	23.1	24.9	24.8	24.6	23.6	22.3	21.1	23.2	25	93	
4	740	30.6	30.3	30.0	30.6	29.5	28.5	29.0	28.0	27.1	29.2	29.0	28.8	28.0	26.8	25.7	28.7	25	115	
4	753	24.8	24.1	23.4	24.3	23.8	23.3	24.0	23.4	22.8	24.6	24.6	24.5	24.0	23.2	22.4	23.8	25	95	104
5	702	98.8	96.3	93.9	96.8	92.9	89.3	91.2	88.0	85.0	86.6	84.0	81.6	81.6	77.0	72.9	87.7	75	117	
5	708	72.9	71.4	70.0	74.1	72.9	71.7	76.0	75.9	75.7	77.7	76.0	74.3	75.0	71.4	68.2	73.6	75	98	
5	728	68.0	66.5	65.1	68.7	67.3	66.0	69.0	68.1	67.2	69.1	67.8	66.5	67.3	64.2	61.4	66.8	75	89	
5	739	91.9	89.5	87.1	91.9	90.1	88.4	91.7	89.8	87.9	91.2	90.1	89.0	87.6	81.6	76.4	88.3	75	118	
5	756	77.0	74.0	71.3	75.7	74.6	73.6	76.5	75.0	73.5	75.3	73.5	71.8	72.5	69.1	66.0	73.3	75	98	104
6	717	222.9	221.6	220.3	224.8	110.2	324.0	231.7	228.2	112.4	336.3	219.3	210.7	228.7	227.3	225.8	223.0	225	99	
6	723	249.6	248.6	247.7	248.7	240.2	232.2	245.2	237.8	230.9	242.6	239.9	237.3	248.7	238.9	229.9	241.2	225	107	
6	725	212.2	211.4	210.5	215.2	211.3	207.6	219.9	214.0	208.3	210.8	201.3	192.5	208.0	205.7	203.5	208.8	225	93	
6	732	262.4	256.1	250.1	250.9	242.1	233.9	245.3	236.5	228.3	236.0	229.8	223.9	235.3	226.8	218.8	238.4	225	106	
6	737	281.3	269.8	259.2	256.1	243.6	232.2	253.6	254.2	254.8	262.7	255.2	248.0	260.2	250.3	241.1	254.8	225	113	104
7	707	27.4	26.1	25.0	26.7	26.0	25.2	26.5	25.4	24.4	25.9	25.3	24.8	25.3	23.9	22.6	25.4	25	101	
7	713	27.4	26.3	25.3	26.7	25.6	24.5	26.3	25.8	25.2	26.3	25.4	24.5	25.3	24.2	23.3	25.5	25	102	
7	730	27.2	26.3	25.5	26.8	25.6	24.5	26.3	25.8	25.3	26.6	25.7	25.0	25.8	24.7	23.7	25.6	25	103	
7	738	23.3	22.9	22.5	24.3	23.7	23.2	24.8	24.1	23.5	25.1	24.7	24.3	24.8	23.5	22.4	23.8	25	95	
7	741	28.1	26.9	25.8	27.6	26.9	26.1	27.6	26.7	25.8	27.0	26.1	25.2	26.0	24.8	23.8	26.3	25	105	101
8	733	80.8	77.2	74.0	78.9	76.3	73.9	78.5	75.5	72.6	78.0	76.6	75.2	73.8	69.4	65.5	75.1	75	100	
8	742	93.1	88.3	83.9	88.7	85.1	81.8	88.2	86.0	83.9	90.5	89.1	87.8	87.4	83.3	79.6	86.5	75	115	
8	746	82.1	81.1	80.1	83.7	79.5	75.6	80.2	77.0	74.1	80.7	80.3	79.9	81.4	79.4	77.4	79.5	75	106	
8	749	72.9	70.2	67.8	73.4	71.9	70.5	75.2	72.7	70.3	75.4	73.9	72.4	71.7	68.1	64.7	71.4	75	95	
8	751	71.1	68.7	66.4	70.5	67.9	65.5	70.8	69.2	67.7	72.6	71.0	69.6	69.7	66.8	64.1	68.8	75	92	102
9	719	229.9	220.7	212.2	110.5	322.6	209.3	223.9	219.8	215.8	219.4	212.0	205.2	219.8	211.1	203.1	215.7	225	96	
9	721	246.8	242.1	237.6	246.3	238.4	230.9	249.2	246.7	244.2	243.1	230.6	219.3	236.2	228.1	220.5	237.3	225	105	
9	729	202.9	199.2	195.6	203.3	197.3	191.6	206.1	203.3	200.7	203.9	197.1	190.6	206.3	200.0	194.1	199.5	225	89	
9	744	263.6	251.9	241.2	251.1	244.0	237.4	252.3	246.1	240.3	242.0	231.9	222.7	237.8	227.8	218.6	240.6	225	107	
9	745	273.0	272.6	272.2	280.4	269.8	260.0	275.3	267.7	260.5	264.4	255.2	246.6	262.1	250.0	238.9	263.2	225	117	103
10	722	92.8	91.2	89.6	95.9	93.6	91.4	94.8	92.4	90.1	93.3	90.7	88.2	90.6	87.0	83.7	91.0	100	91	
10	724	143.7	137.8	132.3	139.1	133.5	128.4	135.4	134.0	132.6	132.5	124.6	117.6	122.0	118.4	115.0	129.8	100	130	
10	727	100.6	95.2	90.4	96.3	93.5	90.8	94.4	92.1	89.9	94.0	92.0	90.2	93.7	91.0	88.5	92.8	100	93	
10	734	109.6	106.7	103.9	112.1	110.1	108.3	110.0	105.0	100.5	106.8	106.3	105.8	111.3	109.4	107.6	107.6	100	108	
10	754	94.7	91.8	89.2	97.3	96.6	96.0	101.5	100.8	100.1	105.4	104.0	102.7	104.5	99.5	95.0	98.6	100	99	104

TABLE A - 3 RAW AND ADJUSTED BLOOD LEAD DATA

PHASE II EXPERIMENT 7

pig number	sample	group	material administered	dosage	qualifier	lab result (ug/L)	day	source file	MATRIX	Adjusted Value (ug/dL)[a]	Notes
706	8-970124	1	control	0	<	1	-4	T951014	BLOOD	0.5	
714	8-970163	1	control	0	<	1	-4	T951014	BLOOD	0.5	
718	8-970167	1	control	0		1.2	-4	T951014	BLOOD	1.2	
735	8-970153	1	control	0	<	1	-4	T951014	BLOOD	0.5	
743	8-970155	1	control	0	<	1	-4	T951014	BLOOD	0.5	
703	8-970141	2	PbAc	25	<	1	-4	T951014	BLOOD	0.5	
709	8-970158	2	PbAc	25	<	1	-4	T951014	BLOOD	0.5	
748	8-970132	2	PbAc	25	<	1	-4	T951014	BLOOD	0.5	
750	8-970120	2	PbAc	25	<	1	-4	T951014	BLOOD	0.5	
755	8-970140	2	PbAc	25	<	1	-4	T951014	BLOOD	0.5	
711	8-970172	3	PbAc	75	<	1	-4	T951014	BLOOD	0.5	
715	8-970129	3	PbAc	75	<	1	-4	T951014	BLOOD	0.5	
716	8-970136	3	PbAc	75	<	1	-4	T951014	BLOOD	0.5	
747	8-970138	3	PbAc	75	<	1	-4	T951014	BLOOD	0.5	
731	8-970145	3	PbAc	75	<	1	-4	T951014	BLOOD	0.5	
704	8-970123	4	Phase I	25	<	1	-4	T951014	BLOOD	0.5	
712	8-970157	4	Phase I	25	<	1	-4	T951014	BLOOD	0.5	
736	8-970133	4	Phase I	25	<	1	-4	T951014	BLOOD	0.5	
740	8-970147	4	Phase I	25	<	1	-4	T951014	BLOOD	0.5	
753	8-970171	4	Phase I	25	<	1	-4	T951014	BLOOD	0.5	
702	8-970152	5	Phase I	75	<	1	-4	T951014	BLOOD	0.5	
708	8-970135	5	Phase I	75	<	1	-4	T951014	BLOOD	0.5	
728	8-970121	5	Phase I	75	<	1	-4	T951014	BLOOD	0.5	
739	8-970154	5	Phase I	75	<	1	-4	T951014	BLOOD	0.5	
756	8-970161	5	Phase I	75	<	1	-4	T951014	BLOOD	0.5	
717	8-970131	6	Phase I	225	<	1	-4	T951014	BLOOD	0.5	
723	8-970148	6	Phase I	225	<	1	-4	T951014	BLOOD	0.5	
725	8-970130	6	Phase I	225	<	1	-4	T951014	BLOOD	0.5	
732	8-970142	6	Phase I	225	<	1	-4	T951014	BLOOD	0.5	
737	8-970174	6	Phase I	225	<	1	-4	T951014	BLOOD	0.5	
707	8-970137	7	Fe/Mn PbO	25	<	1	-4	T951014	BLOOD	0.5	
713	8-970156	7	Fe/Mn PbO	25	<	1	-4	T951014	BLOOD	0.5	
730	8-970159	7	Fe/Mn PbO	25	<	1	-4	T951014	BLOOD	0.5	
738	8-970127	7	Fe/Mn PbO	25	<	1	-4	T951014	BLOOD	0.5	
741	8-970166	7	Fe/Mn PbO	25	<	1	-4	T951014	BLOOD	0.5	
733	8-970144	8	Fe/Mn PbO	75	<	1	-4	T951014	BLOOD	0.5	
742	8-970149	8	Fe/Mn PbO	75	<	1	-4	T951014	BLOOD	0.5	
746	8-970146	8	Fe/Mn PbO	75	<	1	-4	T951014	BLOOD	0.5	
749	8-970165	8	Fe/Mn PbO	75	<	1	-4	T951014	BLOOD	0.5	
751	8-970170	8	Fe/Mn PbO	75	<	1	-4	T951014	BLOOD	0.5	
719	8-970169	9	Fe/Mn PbO	225	<	1	-4	T951014	BLOOD	0.5	
721	8-970168	9	Fe/Mn PbO	225	<	1	-4	T951014	BLOOD	0.5	
729	8-970164	9	Fe/Mn PbO	225	<	1	-4	T951014	BLOOD	0.5	
744	8-970122	9	Fe/Mn PbO	225	<	1	-4	T951014	BLOOD	0.5	
745	8-970150	9	Fe/Mn PbO	225	<	1	-4	T951014	BLOOD	0.5	
722	8-970125	10	IV	100		1.1	-4	T951014	BLOOD	1.1	
724	8-970160	10	IV	100	<	1	-4	T951014	BLOOD	0.5	
727	8-970173	10	IV	100	<	1	-4	T951014	BLOOD	0.5	
734	8-970151	10	IV	100	<	1	-4	T951014	BLOOD	0.5	
754	8-970126	10	IV	100	<	1	-4	T951014	BLOOD	0.5	
706	8-970214	1	control	0	<	1	0	T951018	BLOOD	0.5	
714	8-970229	1	control	0	<	1	0	T951018	BLOOD	0.5	
718	8-970181	1	control	0	<	1	0	T951014	BLOOD	0.5	
735	8-970213	1	control	0	<	1	0	T951018	BLOOD	0.5	
743	8-970179	1	control	0	<	1	0	T951014	BLOOD	0.5	
703	8-970222	2	PbAc	25	<	1	0	T951018	BLOOD	0.5	
709	8-970219	2	PbAc	25	<	1	0	T951018	BLOOD	0.5	
748	8-970193	2	PbAc	25	<	1	0	T951014	BLOOD	0.5	
750	8-970205	2	PbAc	25		5.3	0	T951014	BLOOD	5.3	
755	8-970189	2	PbAc	25	<	1	0	T951014	BLOOD	0.5	
711	8-970226	3	PbAc	75	<	1	0	T951018	BLOOD	0.5	
715	8-970224	3	PbAc	75	<	1	0	T951018	BLOOD	0.5	
716	8-970227	3	PbAc	75	<	1	0	T951018	BLOOD	0.5	
747	8-970202	3	PbAc	75	<	1	0	T951014	BLOOD	0.5	
731	8-970200	3	PbAc	75	<	1	0	T951014	BLOOD	0.5	
704	8-970216	4	Phase I	25	<	1	0	T951018	BLOOD	0.5	
712	8-970209	4	Phase I	25	<	1	0	T951014	BLOOD	0.5	
736	8-970218	4	Phase I	25	<	1	0	T951018	BLOOD	0.5	
740	8-970188	4	Phase I	25	<	1	0	T951014	BLOOD	0.5	
753	8-970183	4	Phase I	25	<	1	0	T951014	BLOOD	0.5	
702	8-970217	5	Phase I	75	<	1	0	T951018	BLOOD	0.5	
708	8-970221	5	Phase I	75	<	1	0	T951018	BLOOD	0.5	
728	8-970204	5	Phase I	75	<	1	0	T951014	BLOOD	0.5	
739	8-970201	5	Phase I	75	<	1	0	T951014	BLOOD	0.5	
756	8-970185	5	Phase I	75	<	1	0	T951014	BLOOD	0.5	
717	8-970195	6	Phase I	225	<	1	0	T951014	BLOOD	0.5	
723	8-970206	6	Phase I	225	<	1	0	T951014	BLOOD	0.5	
725	8-970207	6	Phase I	225	<	1	0	T951014	BLOOD	0.5	
732	8-970177	6	Phase I	225	<	1	0	T951014	BLOOD	0.5	
737	8-970175	6	Phase I	225	<	1	0	T951014	BLOOD	0.5	
707	8-970187	7	Fe/Mn PbO	25			0	T951014	BLOOD		Clotted
713	8-970223	7	Fe/Mn PbO	25	<	1	0	T951018	BLOOD	0.5	
730	8-970215	7	Fe/Mn PbO	25	<	1	0	T951018	BLOOD	0.5	
738	8-970192	7	Fe/Mn PbO	25	<	1	0	T951014	BLOOD	0.5	
741	8-970211	7	Fe/Mn PbO	25	<	1	0	T951018	BLOOD	0.5	
733	8-970176	8	Fe/Mn PbO	75	<	1	0	T951014	BLOOD	0.5	
742	8-970197	8	Fe/Mn PbO	75	<	1	0	T951014	BLOOD	0.5	
746	8-970178	8	Fe/Mn PbO	75	<	1	0	T951014	BLOOD	0.5	

pig number	sample	group	material administered	dosage	qualifier	lab result (ug/L)	day	source file	MATRIX	Adjusted Value (ug/dL)[a]	Notes
749	8-970212	8	Fe/Mn PbO	75	<	1	0	T951018	BLOOD	0.5	
751	8-970194	8	Fe/Mn PbO	75	<	1	0	T951014	BLOOD	0.5	
719	8-970180	9	Fe/Mn PbO	225	<	1	0	T951014	BLOOD	0.5	
721	8-970186	9	Fe/Mn PbO	225	<	1	0	T951014	BLOOD	0.5	
729	8-970225	9	Fe/Mn PbO	225	<	1	0	T951018	BLOOD	0.5	
744	8-970228	9	Fe/Mn PbO	225	<	1	0	T951018	BLOOD	0.5	
745	8-970220	9	Fe/Mn PbO	225	<	1	0	T951018	BLOOD	0.5	
722	8-970198	10	IV	100	<	1	0	T951014	BLOOD	0.5	
724	8-970208	10	IV	100	<	1	0	T951014	BLOOD	0.5	
727	8-970182	10	IV	100	<	1	0	T951014	BLOOD	0.5	
734	8-970191	10	IV	100	<	1	0	T951014	BLOOD	0.5	
754	8-970199	10	IV	100		2.6	0	T951014	BLOOD	2.6	
706	8-970277	1	control	0	<	1	1	T951018	BLOOD	0.5	
714	8-970258	1	control	0	<	1	1	T951018	BLOOD	0.5	
718	8-970268	1	control	0	<	1	1	T951018	BLOOD	0.5	
735	8-970246	1	control	0	<	1	1	T951018	BLOOD	0.5	
743	8-970283	1	control	0	<	1	1	T951018	BLOOD	0.5	
703	8-970251	2	PbAc	25	<	1	1	T951018	BLOOD	0.5	
709	8-970242	2	PbAc	25	<	1	1	T951018	BLOOD	0.5	
748	8-970233	2	PbAc	25	<	1	1	T951018	BLOOD	0.5	
750	8-970262	2	PbAc	25	<	1	1	T951018	BLOOD	0.5	
755	8-970278	2	PbAc	25	<	1	1	T951018	BLOOD	0.5	
711	8-970261	3	PbAc	75	<	1	1	T951018	BLOOD	0.5	
715	8-970248	3	PbAc	75	<	1	1	T951018	BLOOD	0.5	
716	8-970254	3	PbAc	75	<	1	1	T951018	BLOOD	0.5	
747	8-970231	3	PbAc	75		1.4	1	T951018	BLOOD	1.4	
731	8-970241	3	PbAc	75	<	1	1	T951018	BLOOD	0.5	
704	8-970260	4	Phase I	25	<	1	1	T951018	BLOOD	0.5	
712	8-970240	4	Phase I	25	<	1	1	T951018	BLOOD	0.5	
736	8-970237	4	Phase I	25	<	1	1	T951018	BLOOD	0.5	
740	8-970269	4	Phase I	25	<	1	1	T951018	BLOOD	0.5	
753	8-970253	4	Phase I	25	<	1	1	T951018	BLOOD	0.5	
702	8-970255	5	Phase I	75	<	1	1	T951018	BLOOD	0.5	
708	8-970282	5	Phase I	75	<	1	1	T951018	BLOOD	0.5	
728	8-970270	5	Phase I	75		1.2	1	T951018	BLOOD	1.2	
739	8-970230	5	Phase I	75	<	1	1	T951018	BLOOD	0.5	
756	8-970281	5	Phase I	75	<	1	1	T951018	BLOOD	0.5	
717	8-970252	6	Phase I	225		1.8	1	T951018	BLOOD	1.8	
723	8-970272	6	Phase I	225		2.6	1	T951018	BLOOD	2.6	
725	8-970247	6	Phase I	225		3.1	1	T951018	BLOOD	3.1	
732	8-970250	6	Phase I	225	<	1	1	T951018	BLOOD	0.5	
737	8-970271	6	Phase I	225		1.3	1	T951018	BLOOD	1.3	
707	8-970244	7	Fe/Mn PbO	25	<	1	1	T951018	BLOOD	0.5	
713	8-970276	7	Fe/Mn PbO	25	<	1	1	T951018	BLOOD	0.5	
730	8-970259	7	Fe/Mn PbO	25	<	1	1	T951018	BLOOD	0.5	
738	8-970265	7	Fe/Mn PbO	25	<	1	1	T951018	BLOOD	0.5	
741	8-970284	7	Fe/Mn PbO	25	<	1	1	T951018	BLOOD	0.5	
733	8-970234	8	Fe/Mn PbO	75	<	1	1	T951018	BLOOD	0.5	
742	8-970256	8	Fe/Mn PbO	75	<	1	1	T951018	BLOOD	0.5	
746	8-970279	8	Fe/Mn PbO	75	<	1	1	T951018	BLOOD	0.5	
749	8-970264	8	Fe/Mn PbO	75	<	1	1	T951018	BLOOD	0.5	
751	8-970257	8	Fe/Mn PbO	75		1.6	1	T951018	BLOOD	1.6	
719	8-970236	9	Fe/Mn PbO	225		1.4	1	T951018	BLOOD	1.4	
721	8-970263	9	Fe/Mn PbO	225		2.9	1	T951018	BLOOD	2.9	
729	8-970249	9	Fe/Mn PbO	225		3	1	T951018	BLOOD	3	
744	8-970267	9	Fe/Mn PbO	225		2.2	1	T951018	BLOOD	2.2	
745	8-970274	9	Fe/Mn PbO	225		2.2	1	T951018	BLOOD	2.2	
722	8-970273	10	IV	100		11.5	1	T951018	BLOOD	11.5	
724	8-970232	10	IV	100		11.8	1	T951018	BLOOD	11.8	
727	8-970239	10	IV	100		15.9	1	T951018	BLOOD	15.9	
734	8-970243	10	IV	100		7.7	1	T951018	BLOOD	7.7	
754	8-970266	10	IV	100		8.9	1	T951018	BLOOD	8.9	
706	8-970308	1	control	0	<	1	2	T951018	BLOOD	0.5	
714	8-970329	1	control	0	<	1	2	T951018	BLOOD	0.5	
718	8-970298	1	control	0	<	1	2	T951018	BLOOD	0.5	
735	8-970323	1	control	0	<	1	2	T951018	BLOOD	0.5	
743	8-970300	1	control	0	<	1	2	T951018	BLOOD	0.5	
703	8-970291	2	PbAc	25	<	1	2	T951018	BLOOD	0.5	
709	8-970332	2	PbAc	25	<	1	2	T951018	BLOOD	0.5	
748	8-970293	2	PbAc	25	<	1	2	T951018	BLOOD	0.5	
750	8-970312	2	PbAc	25	<	1	2	T951018	BLOOD	0.5	
755	8-970311	2	PbAc	25	<	1	2	T951018	BLOOD	0.5	
711	8-970327	3	PbAc	75		1.2	2	T951018	BLOOD	1.2	
715	8-970328	3	PbAc	75	<	1	2	T951018	BLOOD	0.5	
716	8-970319	3	PbAc	75		2.3	2	T951018	BLOOD	2.3	
747	8-970335	3	PbAc	75		2.5	2	T951018	BLOOD	2.5	
731	8-970304	3	PbAc	75		1.8	2	T951018	BLOOD	1.8	
704	8-970317	4	Phase I	25	<	1	2	T951018	BLOOD	0.5	
712	8-970297	4	Phase I	25	<	1	2	T951018	BLOOD	0.5	
736	8-970316	4	Phase I	25	<	1	2	T951018	BLOOD	0.5	
740	8-970322	4	Phase I	25	<	1	2	T951018	BLOOD	0.5	
753	8-970303	4	Phase I	25	<	1	2	T951018	BLOOD	0.5	
702	8-970330	5	Phase I	75	<	1	2	T951018	BLOOD	0.5	
708	8-970310	5	Phase I	75		2.3	2	T951018	BLOOD	2.3	
728	8-970321	5	Phase I	75		2.8	2	T951018	BLOOD	2.8	
739	8-970290	5	Phase I	75		1	2	T951018	BLOOD	1	
756	8-970337	5	Phase I	75		1.2	2	T951018	BLOOD	1.2	
717	8-970301	6	Phase I	225		5.8	2	T951018	BLOOD	5.8	
723	8-970305	6	Phase I	225		6	2	T951018	BLOOD	6	
725	8-970286	6	Phase I	225		4.7	2	T951018	BLOOD	4.7	
732	8-970302	6	Phase I	225		2.3	2	T951018	BLOOD	2.3	

pig number	sample	group	material administered	dosage	qualifier	lab result (ug/L)	day	source file	MATRIX	Adjusted Value (ug/dL)[a]	Notes
737	8-970288	6	Phase I	225		1.9	2	T951018	BLOOD	1.9	
707	8-970325	7	Fe/Mn PbO	25		2.7	2	T951018	BLOOD	2.7	
713	8-970338	7	Fe/Mn PbO	25	<	1	2	T951018	BLOOD	0.5	
730	8-970292	7	Fe/Mn PbO	25	<	1	2	T951018	BLOOD	0.5	
738	8-970299	7	Fe/Mn PbO	25	<	1	2	T951018	BLOOD	0.5	
741	8-970309	7	Fe/Mn PbO	25		1	2	T951018	BLOOD	1	
733	8-970336	8	Fe/Mn PbO	75		1.9	2	T951018	BLOOD	1.9	
742	8-970285	8	Fe/Mn PbO	75	<	1	2	T951018	BLOOD	0.5	
746	8-970333	8	Fe/Mn PbO	75	<	1	2	T951018	BLOOD	0.5	
749	8-970295	8	Fe/Mn PbO	75	<	1	2	T951018	BLOOD	0.5	
751	8-970313	8	Fe/Mn PbO	75		1.7	2	T951018	BLOOD	1.7	
719	8-970339	9	Fe/Mn PbO	225		4.5	2	T951018	BLOOD	4.5	
721	8-970315	9	Fe/Mn PbO	225		7.3	2	T951018	BLOOD	7.3	
729	8-970294	9	Fe/Mn PbO	225		3.7	2	T951018	BLOOD	3.7	
744	8-970306	9	Fe/Mn PbO	225		4.6	2	T951018	BLOOD	4.6	
745	8-970289	9	Fe/Mn PbO	225		5.6	2	T951018	BLOOD	5.6	
722	8-970296	10	IV	100		12.2	2	T951018	BLOOD	12.2	
724	8-970326	10	IV	100		15	2	T951018	BLOOD	15	
727	8-970324	10	IV	100		20.8	2	T951018	BLOOD	20.8	
734	8-970307	10	IV	100		9.2	2	T951018	BLOOD	9.2	
754	8-970334	10	IV	100		11.9	2	T951018	BLOOD	11.9	
706	8-970389	1	control	0	<	1	3	T951018	BLOOD	0.5	
714	8-970367	1	control	0	<	1	3	T951018	BLOOD	0.5	
718	8-970394	1	control	0	<	1	3	T951023	BLOOD	0.5	
735	8-970344	1	control	0	<	1	3	T951018	BLOOD	0.5	
743	8-970350	1	control	0	<	1	3	T951018	BLOOD	0.5	
703	8-970365	2	PbAc	25	<	1	3	T951018	BLOOD	0.5	
709	8-970340	2	PbAc	25	<	1	3	T951018	BLOOD	0.5	
748	8-970357	2	PbAc	25	<	1	3	T951018	BLOOD	0.5	
750	8-970351	2	PbAc	25	<	1	3	T951018	BLOOD	0.5	
755	8-970368	2	PbAc	25	<	1	3	T951018	BLOOD	0.5	
711	8-970363	3	PbAc	75	<	1	3	T951018	BLOOD	0.5	
715	8-970384	3	PbAc	75	<	1	3	T951018	BLOOD	0.5	
716	8-970354	3	PbAc	75		1.9	3	T951018	BLOOD	1.9	
747	8-970387	3	PbAc	75		2.3	3	T951018	BLOOD	2.3	
731	8-970378	3	PbAc	75		2.3	3	T951018	BLOOD	2.3	
704	8-970346	4	Phase I	25	<	1	3	T951018	BLOOD	0.5	
712	8-970385	4	Phase I	25	<	1	3	T951018	BLOOD	0.5	
736	8-970359	4	Phase I	25	<	1	3	T951018	BLOOD	0.5	
740	8-970366	4	Phase I	25	<	1	3	T951018	BLOOD	0.5	
753	8-970386	4	Phase I	25	<	1	3	T951018	BLOOD	0.5	
702	8-970393	5	Phase I	75		1.1	3	T951023	BLOOD	1.1	
708	8-970353	5	Phase I	75		2	3	T951018	BLOOD	2	
728	8-970383	5	Phase I	75		2.5	3	T951018	BLOOD	2.5	
739	8-970370	5	Phase I	75		3	3	T951018	BLOOD	3	
756	8-970391	5	Phase I	75		1.5	3	T951023	BLOOD	1.5	
717	8-970349	6	Phase I	225		5.4	3	T951018	BLOOD	5.4	
723	8-970355	6	Phase I	225		6	3	T951018	BLOOD	6	
725	8-970380	6	Phase I	225		4.6	3	T951018	BLOOD	4.6	
732	8-970382	6	Phase I	225		2.6	3	T951018	BLOOD	2.6	
737	8-970390	6	Phase I	225		4.1	3	T951023	BLOOD	4.1	
707	8-970377	7	Fe/Mn PbO	25		2.2	3	T951018	BLOOD	2.2	
713	8-970371	7	Fe/Mn PbO	25		1.3	3	T951018	BLOOD	1.3	
730	8-970388	7	Fe/Mn PbO	25	<	1	3	T951018	BLOOD	0.5	
738	8-970372	7	Fe/Mn PbO	25	<	1	3	T951018	BLOOD	0.5	
741	8-970342	7	Fe/Mn PbO	25	<	1	3	T951018	BLOOD	0.5	
733	8-970361	8	Fe/Mn PbO	75		1.2	3	T951018	BLOOD	1.2	
742	8-970362	8	Fe/Mn PbO	75	<	1	3	T951018	BLOOD	0.5	
746	8-970364	8	Fe/Mn PbO	75		1	3	T951018	BLOOD	1	
749	8-970345	8	Fe/Mn PbO	75	<	1	3	T951018	BLOOD	0.5	
751	8-970348	8	Fe/Mn PbO	75		2	3	T951018	BLOOD	2	
719	8-970352	9	Fe/Mn PbO	225		3.8	3	T951018	BLOOD	3.8	
721	8-970374	9	Fe/Mn PbO	225		5.8	3	T951018	BLOOD	5.8	
729	8-970341	9	Fe/Mn PbO	225		6.9	3	T951018	BLOOD	6.9	
744	8-970392	9	Fe/Mn PbO	225		5.6	3	T951023	BLOOD	5.6	
745	8-970356	9	Fe/Mn PbO	225		5.8	3	T951018	BLOOD	5.8	
722	8-970376	10	IV	100		13.3	3	T951018	BLOOD	13.3	
724	8-970379	10	IV	100		13.5	3	T951018	BLOOD	13.5	
727	8-970360	10	IV	100		18.8	3	T951018	BLOOD	18.8	
734	8-970375	10	IV	100		9.6	3	T951018	BLOOD	9.6	
754	8-970347	10	IV	100		14.3	3	T951018	BLOOD	14.3	
706	8-970413	1	control	0	<	1	5	T951023	BLOOD	0.5	
714	8-970435	1	control	0	<	1	5	T951023	BLOOD	0.5	
718	8-970401	1	control	0	<	1	5	T951023	BLOOD	0.5	
735	8-970415	1	control	0	<	1	5	T951023	BLOOD	0.5	
743	8-970424	1	control	0	<	1	5	T951023	BLOOD	0.5	
703	8-970410	2	PbAc	25	<	1	5	T951023	BLOOD	0.5	
709	8-970440	2	PbAc	25	<	1	5	T951023	BLOOD	0.5	
748	8-970420	2	PbAc	25	<	1	5	T951023	BLOOD	0.5	
750	8-970421	2	PbAc	25	<	1	5	T951023	BLOOD	0.5	
755	8-970418	2	PbAc	25		1.8	5	T951023	BLOOD	1.8	
711	8-970434	3	PbAc	75	<	1	5	T951023	BLOOD	0.5	
715	8-970397	3	PbAc	75		1.7	5	T951023	BLOOD	1.7	
716	8-970395	3	PbAc	75		5.3	5	T951023	BLOOD	5.3	
747	8-970443	3	PbAc	75		3	5	T951023	BLOOD	3	
731	8-970402	3	PbAc	75		2.7	5	T951023	BLOOD	2.7	
704	8-970409	4	Phase I	25	<	1	5	T951023	BLOOD	0.5	
712	8-970419	4	Phase I	25	<	1	5	T951023	BLOOD	0.5	
736	8-970433	4	Phase I	25	<	1	5	T951023	BLOOD	0.5	
740	8-970405	4	Phase I	25	<	1	5	T951023	BLOOD	0.5	
753	8-970445	4	Phase I	25	<	1	5	T951023	BLOOD	0.5	

pig number	sample	group	material administered	dosage	qualifier	lab result (ug/L)	day	source file	MATRIX	Adjusted Value (ug/dL)[a]	Notes
702	8-970412	5	Phase I	75		1.1	5	T951023	BLOOD	1.1	
708	8-970446	5	Phase I	75		3	5	T951023	BLOOD	3	
728	8-970396	5	Phase I	75		3.7	5	T951023	BLOOD	3.7	
739	8-970398	5	Phase I	75		1.1	5	T951023	BLOOD	1.1	
756	8-970426	5	Phase I	75		3.2	5	T951023	BLOOD	3.2	
717	8-970422	6	Phase I	225		8.4	5	T951023	BLOOD	8.4	
723	8-970423	6	Phase I	225		5.5	5	T951023	BLOOD	5.5	
725	8-970436	6	Phase I	225		4.7	5	T951023	BLOOD	4.7	
732	8-970407	6	Phase I	225		4.2	5	T951023	BLOOD	4.2	
737	8-970428	6	Phase I	225		5.3	5	T951023	BLOOD	5.3	
707	8-970427	7	Fe/Mn PbO	25		1.9	5	T951023	BLOOD	1.9	
713	8-970408	7	Fe/Mn PbO	25	<	1	5	T951023	BLOOD	0.5	
730	8-970438	7	Fe/Mn PbO	25		1.1	5	T951023	BLOOD	1.1	
738	8-970400	7	Fe/Mn PbO	25	<	1	5	T951023	BLOOD	0.5	
741	8-970447	7	Fe/Mn PbO	25		1	5	T951023	BLOOD	1	
733	8-970411	8	Fe/Mn PbO	75		1.2	5	T951023	BLOOD	1.2	
742	8-970416	8	Fe/Mn PbO	75		1.7	5	T951023	BLOOD	1.7	
746	8-970441	8	Fe/Mn PbO	75		2.5	5	T951023	BLOOD	2.5	
749	8-970430	8	Fe/Mn PbO	75	<	1	5	T951023	BLOOD	0.5	
751	8-970439	8	Fe/Mn PbO	75		3.6	5	T951023	BLOOD	3.6	
719	8-970437	9	Fe/Mn PbO	225		4	5	T951023	BLOOD	4	
721	8-970417	9	Fe/Mn PbO	225		10.7	5	T951023	BLOOD	10.7	
729	8-970442	9	Fe/Mn PbO	225		8.3	5	T951023	BLOOD	8.3	
744	8-970448	9	Fe/Mn PbO	225		5.6	5	T951023	BLOOD	5.6	
745	8-970449	9	Fe/Mn PbO	225		6.3	5	T951023	BLOOD	6.3	
722	8-970431	10	IV	100		15.6	5	T951023	BLOOD	15.6	
724	8-970399	10	IV	100		17.7	5	T951023	BLOOD	17.7	
727	8-970425	10	IV	100		19.9	5	T951023	BLOOD	19.9	
734	8-970406	10	IV	100		11.1	5	T951023	BLOOD	11.1	
754	8-970444	10	IV	100		14.5	5	T951023	BLOOD	14.5	
706	8-970497	1	control	0	<	1	7	T951023	BLOOD	0.5	
714	8-970456	1	control	0	<	1	7	T951023	BLOOD	0.5	
718	8-970500	1	control	0	<	1	7	T951023	BLOOD	0.5	
735	8-970484	1	control	0	<	1	7	T951023	BLOOD	0.5	
743	8-970468	1	control	0	<	1	7	T951023	BLOOD	0.5	
703	8-970480	2	PbAc	25	<	1	7	T951023	BLOOD	0.5	
709	8-970502	2	PbAc	25	<	1	7	T951023	BLOOD	0.5	
748	8-970450	2	PbAc	25		1	7	T951023	BLOOD	1	
750	8-970467	2	PbAc	25	<	1	7	T951023	BLOOD	0.5	
755	8-970492	2	PbAc	25		2	7	T951023	BLOOD	2	
711	8-970452	3	PbAc	75		1.9	7	T951023	BLOOD	1.9	
715	8-970462	3	PbAc	75		1.6	7	T951023	BLOOD	1.6	
716	8-970495	3	PbAc	75		5.6	7	T951023	BLOOD	5.6	
747	8-970461	3	PbAc	75		3.4	7	T951023	BLOOD	3.4	
731	8-970483	3	PbAc	75		3.8	7	T951023	BLOOD	3.8	
704	8-970486	4	Phase I	25	<	1	7	T951023	BLOOD	0.5	
712	8-970463	4	Phase I	25		1.1	7	T951023	BLOOD	1.1	
736	8-970475	4	Phase I	25	<	1	7	T951023	BLOOD	0.5	
740	8-970482	4	Phase I	25	<	1	7	T951023	BLOOD	0.5	
753	8-970471	4	Phase I	25	<	1	7	T951023	BLOOD	0.5	
702	8-970476	5	Phase I	75		1.6	7	T951023	BLOOD	1.6	
708	8-970479	5	Phase I	75		2.7	7	T951023	BLOOD	2.7	
728	8-970503	5	Phase I	75		3.7	7	T951023	BLOOD	3.7	
739	8-970487	5	Phase I	75		1.9	7	T951023	BLOOD	1.9	
756	8-970454	5	Phase I	75		3	7	T951023	BLOOD	3	
717	8-970499	6	Phase I	225		6.1	7	T951023	BLOOD	6.1	
723	8-970470	6	Phase I	225		6.2	7	T951023	BLOOD	6.2	
725	8-970474	6	Phase I	225		5.7	7	T951023	BLOOD	5.7	
732	8-970481	6	Phase I	225		6.2	7	T951023	BLOOD	6.2	
737	8-970469	6	Phase I	225		5.4	7	T951023	BLOOD	5.4	
707	8-970464	7	Fe/Mn PbO	25		2	7	T951023	BLOOD	2	
713	8-970491	7	Fe/Mn PbO	25	<	1	7	T951023	BLOOD	0.5	
730	8-970457	7	Fe/Mn PbO	25		2.2	7	T951023	BLOOD	2.2	
738	8-970496	7	Fe/Mn PbO	25	<	1	7	T951023	BLOOD	0.5	
741	8-970485	7	Fe/Mn PbO	25	<	1	7	T951023	BLOOD	0.5	
733	8-970501	8	Fe/Mn PbO	75		2	7	T951023	BLOOD	2	
742	8-970466	8	Fe/Mn PbO	75		1.4	7	T951023	BLOOD	1.4	
746	8-970459	8	Fe/Mn PbO	75		2.5	7	T951023	BLOOD	2.5	
749	8-970478	8	Fe/Mn PbO	75		1.6	7	T951023	BLOOD	1.6	
751	8-970477	8	Fe/Mn PbO	75		3	7	T951023	BLOOD	3	
719	8-970494	9	Fe/Mn PbO	225		6.1	7	T951023	BLOOD	6.1	
721	8-970455	9	Fe/Mn PbO	225		7.9	7	T951023	BLOOD	7.9	
729	8-970460	9	Fe/Mn PbO	225		8.5	7	T951023	BLOOD	8.5	
744	8-970504	9	Fe/Mn PbO	225		6.2	7	T951023	BLOOD	6.2	
745	8-970451	9	Fe/Mn PbO	225		7.2	7	T951023	BLOOD	7.2	
722	8-970465	10	IV	100		18.1	7	T951023	BLOOD	18.1	
724	8-970453	10	IV	100		16.7	7	T951023	BLOOD	16.7	
727	8-970472	10	IV	100		23.3	7	T951023	BLOOD	23.3	
734	8-970488	10	IV	100		13.3	7	T951023	BLOOD	13.3	
754	8-970498	10	IV	100		15.8	7	T951023	BLOOD	15.8	
706	8-970526	1	control	0	<	1	9	T951023	BLOOD	0.5	
714	8-970528	1	control	0	<	1	9	T951023	BLOOD	0.5	
718	8-970510	1	control	0	<	1	9	T951023	BLOOD	0.5	
735	8-970537	1	control	0		1.5	9	T951023	BLOOD	1.5	
743	8-970549	1	control	0	<	1	9	T951023	BLOOD	0.5	
703	8-970530	2	PbAc	25		1.8	9	T951023	BLOOD	1.8	
709	8-970506	2	PbAc	25	<	1	9	T951023	BLOOD	0.5	
748	8-970518	2	PbAc	25		1	9	T951023	BLOOD	1	
750	8-970541	2	PbAc	25		1.5	9	T951023	BLOOD	1.5	
755	8-970539	2	PbAc	25		2.7	9	T951023	BLOOD	2.7	
711	8-970553	3	PbAc	75		2.3	9	T951023	BLOOD	2.3	

pig number	sample	group	material administered	dosage	qualifier	lab result (ug/L)	day	source file	MATRIX	Adjusted Value (ug/dL)[a]	Notes
715	8-970536	3	PbAc	75		3.5	9	T951023	BLOOD	3.5	
716	8-970516	3	PbAc	75		6.5	9	T951023	BLOOD	6.5	
747	8-970557	3	PbAc	75		4.2	9	T951023	BLOOD	4.2	
731	8-970551	3	PbAc	75		5.8	9	T951023	BLOOD	5.8	
704	8-970532	4	Phase I	25		1.5	9	T951023	BLOOD	1.5	
712	8-970538	4	Phase I	25		1.9	9	T951023	BLOOD	1.9	
736	8-970521	4	Phase I	25	<	1	9	T951023	BLOOD	0.5	
740	8-970509	4	Phase I	25		2.1	9	T951023	BLOOD	2.1	
753	8-970558	4	Phase I	25		1.3	9	T951023	BLOOD	1.3	
702	8-970513	5	Phase I	75		2.6	9	T951023	BLOOD	2.6	
708	8-970507	5	Phase I	75		4.3	9	T951023	BLOOD	4.3	
728	8-970531	5	Phase I	75		3.9	9	T951023	BLOOD	3.9	
739	8-970559	5	Phase I	75		2.1	9	T951023	BLOOD	2.1	
756	8-970519	5	Phase I	75		3.5	9	T951023	BLOOD	3.5	
717	8-970523	6	Phase I	225		1.8	9	T951023	BLOOD	1.8	
723	8-970556	6	Phase I	225		7.1	9	T951023	BLOOD	7.1	
725	8-970529	6	Phase I	225		6.3	9	T951023	BLOOD	6.3	
732	8-970548	6	Phase I	225		6.1	9	T951023	BLOOD	6.1	
737	8-970534	6	Phase I	225		6.9	9	T951023	BLOOD	6.9	
707	8-970540	7	Fe/Mn PbO	25		3	9	T951023	BLOOD	3	
713	8-970546	7	Fe/Mn PbO	25	<	1	9	T951023	BLOOD	0.5	
730	8-970517	7	Fe/Mn PbO	25		3	9	T951023	BLOOD	3	
738	8-970550	7	Fe/Mn PbO	25	<	1	9	T951023	BLOOD	0.5	
741	8-970511	7	Fe/Mn PbO	25		2.2	9	T951023	BLOOD	2.2	
733	8-970520	8	Fe/Mn PbO	75		3.6	9	T951023	BLOOD	3.6	
742	8-970512	8	Fe/Mn PbO	75		2.5	9	T951023	BLOOD	2.5	
746	8-970525	8	Fe/Mn PbO	75		3.4	9	T951023	BLOOD	3.4	
749	8-970514	8	Fe/Mn PbO	75		2.4	9	T951023	BLOOD	2.4	
751	8-970542	8	Fe/Mn PbO	75		4.1	9	T951023	BLOOD	4.1	
719	8-970552	9	Fe/Mn PbO	225		6.5	9	T951023	BLOOD	6.5	
721	8-970524	9	Fe/Mn PbO	225		9.5	9	T951023	BLOOD	9.5	
729	8-970505	9	Fe/Mn PbO	225		10.1	9	T951023	BLOOD	10.1	
744	8-970554	9	Fe/Mn PbO	225		6.7	9	T951023	BLOOD	6.7	
745	8-970543	9	Fe/Mn PbO	225		6.9	9	T951023	BLOOD	6.9	
722	8-970535	10	IV	100		20	9	T951023	BLOOD	20	
724	8-970527	10	IV	100		21	9	T951023	BLOOD	21	
727	8-970508	10	IV	100		24.2	9	T951023	BLOOD	24.2	
734	8-970545	10	IV	100		12.5	9	T951023	BLOOD	12.5	
754	8-970515	10	IV	100		17.9	9	T951023	BLOOD	17.9	
706	8-970602	1	control	0	<	1	12	T951023	BLOOD	0.5	
714	8-970578	1	control	0	<	1	12	T951023	BLOOD	0.5	
718	8-970566	1	control	0	<	1	12	T951023	BLOOD	0.5	
735	8-970608	1	control	0	<	1	12	T951023	BLOOD	0.5	
743	8-970577	1	control	0	<	1	12	T951023	BLOOD	0.5	
703	8-970560	2	PbAc	25	<	1	12	T951023	BLOOD	0.5	
709	8-970592	2	PbAc	25	<	1	12	T951023	BLOOD	0.5	
748	8-970594	2	PbAc	25		1.1	12	T951023	BLOOD	1.1	
750	8-970601	2	PbAc	25		2.2	12	T951023	BLOOD	2.2	
755	8-970574	2	PbAc	25		2.7	12	T951023	BLOOD	2.7	
711	8-970604	3	PbAc	75		1.4	12	T951023	BLOOD	1.4	
715	8-970580	3	PbAc	75	<	1	12	T951023	BLOOD	0.5	
716	8-970562	3	PbAc	75		14.4	12	T951023	BLOOD	14.4	
747	8-970600	3	PbAc	75		2.4	12	T951023	BLOOD	2.4	
731	8-970591	3	PbAc	75		3.7	12	T951023	BLOOD	3.7	
704	8-970584	4	Phase I	25	<	1	12	T951023	BLOOD	0.5	
712	8-970565	4	Phase I	25	<	1	12	T951023	BLOOD	0.5	
736	8-970571	4	Phase I	25	<	1	12	T951023	BLOOD	0.5	
740	8-970595	4	Phase I	25	<	1	12	T951023	BLOOD	0.5	
753	8-970589	4	Phase I	25	<	1	12	T951023	BLOOD	0.5	
702	8-970590	5	Phase I	75		2.6	12	T951023	BLOOD	2.6	
708	8-970599	5	Phase I	75		3.1	12	T951023	BLOOD	3.1	
728	8-970588	5	Phase I	75		2.1	12	T951023	BLOOD	2.1	
739	8-970581	5	Phase I	75		3	12	T951023	BLOOD	3	
756	8-970611	5	Phase I	75		3.4	12	T951023	BLOOD	3.4	
717	8-970607	6	Phase I	225		4.8	12	T951023	BLOOD	4.8	
723	8-970610	6	Phase I	225		6.8	12	T951023	BLOOD	6.8	
725	8-970563	6	Phase I	225		5	12	T951023	BLOOD	5	
732	8-970585	6	Phase I	225		4.8	12	T951023	BLOOD	4.8	
737	8-970572	6	Phase I	225		6	12	T951023	BLOOD	6	
707	8-970609	7	Fe/Mn PbO	25		1.5	12	T951023	BLOOD	1.5	
713	8-970593	7	Fe/Mn PbO	25		1.2	12	T951023	BLOOD	1.2	
730	8-970576	7	Fe/Mn PbO	25		2	12	T951023	BLOOD	2	
738	8-970605	7	Fe/Mn PbO	25	<	1	12	T951023	BLOOD	0.5	
741	8-970596	7	Fe/Mn PbO	25		1	12	T951023	BLOOD	1	
733	8-970598	8	Fe/Mn PbO	75		2.8	12	T951023	BLOOD	2.8	
742	8-970573	8	Fe/Mn PbO	75		1.9	12	T951023	BLOOD	1.9	
746	8-970568	8	Fe/Mn PbO	75		1.5	12	T951023	BLOOD	1.5	
749	8-970606	8	Fe/Mn PbO	75		2	12	T951023	BLOOD	2	
751	8-970582	8	Fe/Mn PbO	75		4.4	12	T951023	BLOOD	4.4	
719	8-970614	9	Fe/Mn PbO	225		7	12	T951023	BLOOD	7	
721	8-970575	9	Fe/Mn PbO	225		6.8	12	T951023	BLOOD	6.8	
729	8-970603	9	Fe/Mn PbO	225		10.5	12	T951023	BLOOD	10.5	
744	8-970561	9	Fe/Mn PbO	225		7	12	T951023	BLOOD	7	
745	8-970612	9	Fe/Mn PbO	225		9.3	12	T951023	BLOOD	9.3	
722	8-970597	10	IV	100		16.2	12	T951023	BLOOD	16.2	
724	8-970613	10	IV	100		16.5	12	T951023	BLOOD	16.5	
727	8-970570	10	IV	100		21.9	12	T951023	BLOOD	21.9	
734	8-970583	10	IV	100		12.1	12	T951023	BLOOD	12.1	
754	8-970564	10	IV	100		10.7	12	T951023	BLOOD	10.7	
706	8-970628	1	control	0	<	1	15	T951023	BLOOD	0.5	
714	8-970622	1	control	0	<	1	15	T951023	BLOOD	0.5	

pig number	sample	group	material administered	dosage	qualifier	lab result (ug/L)	day	source file	MATRIX	Adjusted Value (ug/dL)[a]	Notes
718	8-970626	1	control	0	<	1	15	T951023	BLOOD	0.5	
735	8-970621	1	control	0	<	1	15	T951023	BLOOD	0.5	
743	8-970666	1	control	0	<	1	15	T951101	BLOOD	0.5	
703	8-970657	2	PbAc	25	<	1	15	T951101	BLOOD	0.5	
709	8-970642	2	PbAc	25	<	1	15	T951023	BLOOD	0.5	
748	8-970650	2	PbAc	25	<	1	15	T951018	BLOOD	0.5	
750	8-970656	2	PbAc	25		2.1	15	T951101	BLOOD	2.1	
755	8-970648	2	PbAc	25		3.3	15	T951023	BLOOD	3.3	
711	8-970625	3	PbAc	75		2.9	15	T951023	BLOOD	2.9	
715	8-970629	3	PbAc	75		2.1	15	T951023	BLOOD	2.1	
716	8-970643	3	PbAc	75		12.9	15	T951023	BLOOD	12.9	
747	8-970641	3	PbAc	75		4.9	15	T951023	BLOOD	4.9	
731	8-970630	3	PbAc	75		4.2	15	T951023	BLOOD	4.2	
704	8-970645	4	Phase I	25	<	1	15	T951023	BLOOD	0.5	
712	8-970633	4	Phase I	25	<	1	15	T951023	BLOOD	0.5	
736	8-970619	4	Phase I	25	<	1	15	T951023	BLOOD	0.5	
740	8-970627	4	Phase I	25	<	1	15	T951023	BLOOD	0.5	
753	8-970624	4	Phase I	25		2.6	15	T951023	BLOOD	2.6	
702	8-970618	5	Phase I	75		3.7	15	T951023	BLOOD	3.7	
708	8-970644	5	Phase I	75		3.4	15	T951023	BLOOD	3.4	
728	8-970640	5	Phase I	75		3.5	15	T951023	BLOOD	3.5	
739	8-970639	5	Phase I	75		4.5	15	T951023	BLOOD	4.5	
756	8-970652	5	Phase I	75		3.3	15	T951101	BLOOD	3.3	
717	8-970667	6	Phase I	225		6.4	15	T951101	BLOOD	6.4	
723	8-970651	6	Phase I	225		10.2	15	T951101	BLOOD	10.2	
725	8-970623	6	Phase I	225		7.9	15	T951023	BLOOD	7.9	
732	8-970616	6	Phase I	225		6.8	15	T951023	BLOOD	6.8	
737	8-970660	6	Phase I	225		5.1	15	T951101	BLOOD	5.1	
707	8-970654	7	Fe/Mn PbO	25		1.5	15	T951101	BLOOD	1.5	
713	8-970646	7	Fe/Mn PbO	25		1.4	15	T951023	BLOOD	1.4	
730	8-970634	7	Fe/Mn PbO	25		3.3	15	T951023	BLOOD	3.3	
738	8-970655	7	Fe/Mn PbO	25		1.1	15	T951101	BLOOD	1.1	
741	8-970638	7	Fe/Mn PbO	25		2.7	15	T951023	BLOOD	2.7	
733	8-970661	8	Fe/Mn PbO	75		3.6	15	T951101	BLOOD	3.6	
742	8-970631	8	Fe/Mn PbO	75		3.5	15	T951023	BLOOD	3.5	
746	8-970669	8	Fe/Mn PbO	75		4.3	15	T951101	BLOOD	4.3	
749	8-970647	8	Fe/Mn PbO	75		3.8	15	T951023	BLOOD	3.8	
751	8-970615	8	Fe/Mn PbO	75		6.5	15	T951023	BLOOD	6.5	
719	8-970649	9	Fe/Mn PbO	225		9.4	15	T951023	BLOOD	9.4	
721	8-970663	9	Fe/Mn PbO	225		10	15	T951101	BLOOD	10	
729	8-970637	9	Fe/Mn PbO	225		10.8	15	T951023	BLOOD	10.8	
744	8-970635	9	Fe/Mn PbO	225		8.4	15	T951023	BLOOD	8.4	
745	8-970668	9	Fe/Mn PbO	225		8.1	15	T951101	BLOOD	8.1	
722	8-970665	10	IV	100		17.9	15	T951101	BLOOD	17.9	
724	8-970617	10	IV	100		16.7	15	T951023	BLOOD	16.7	
727	8-970653	10	IV	100		23.3	15	T951101	BLOOD	23.3	
734	8-970658	10	IV	100		13.1	15	T951101	BLOOD	13.1	
754	8-970636	10	IV	100		11.3	15	T951023	BLOOD	11.3	

a Non-detects evaluated using 1/2 the quantitation limit; laboratory results (ug/L) converted to concentration in blood (ug/dL) by dividing by dilution factor of 1 dL/L.

TABLE A-4 BLOOD LEAD OUTLIERS

Flagged Data Points
Outliers

test material	target dosage	Actual Dose*	group	pig#	BLOOD LEAD (ug/dL) BY DAY									
					-4	0	1	2	3	5	7	9	12	15
control	0	0.00	1	706	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
control	0	0.00	1	714	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
control	0	0.00	1	718	1.2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
control	0	0.00	1	735	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1.5	0.5	0.5
control	0	0.00	1	743	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PbAc	25	29.54	2	703	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1.8	0.5	0.5
PbAc	25	35.21	2	709	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PbAc	25	23.82	2	748	0.5	0.5	0.5	0.5	0.5	0.5	1	1	1.1	0.5
PbAc	25	21.66	2	750	0.5	5.3	0.5	0.5	0.5	0.5	0.5	1.5	2.2	2.1
PbAc	25	23.35	2	755	0.5	0.5	0.5	0.5	0.5	1.8	2	2.7	2.7	3.3
PbAc	75	69.07	3	711	0.5	0.5	0.5	1.2	0.5	0.5	1.9	2.3	1.4	2.9
PbAc	75	78.87	3	715	0.5	0.5	0.5	0.5	0.5	1.7	1.6	3.5	0.5	2.1
PbAc	75	67.65	3	716	0.5	0.5	0.5	2.3	1.9	5.3	5.6	6.5	14.4	12.9
PbAc	75	77.43	3	747	0.5	0.5	1.4	2.5	2.3	3	3.4	4.2	2.4	4.9
PbAc	75	75.18	3	731	0.5	0.5	0.5	1.8	2.3	2.7	3.8	5.8	3.7	4.2
Phase I	25	29.36	4	704	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1.5	0.5	0.5
Phase I	25	25.29	4	712	0.5	0.5	0.5	0.5	0.5	0.5	1.1	1.9	0.5	0.5
Phase I	25	23.17	4	736	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Phase I	25	28.74	4	740	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2.1	0.5	0.5
Phase I	25	23.81	4	753	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1.3	0.5	2.6
Phase I	75	87.72	5	702	0.5	0.5	0.5	0.5	1.1	1.1	1.6	2.6	2.6	3.7
Phase I	75	73.55	5	708	0.5	0.5	0.5	2.3	2	3	2.7	4.3	3.1	3.4
Phase I	75	66.81	5	728	0.5	0.5	1.2	2.8	2.5	3.7	3.7	3.9	2.1	3.5
Phase I	75	88.29	5	739	0.5	0.5	0.5	1	3	1.1	1.9	2.1	3	4.5
Phase I	75	73.29	5	756	0.5	0.5	0.5	1.2	1.5	3.2	3	3.5	3.4	3.3
Phase I	225	222.95	6	717	0.5	0.5	1.8	5.8	5.4	8.4	6.1	1.8	4.8	6.4
Phase I	225	241.21	6	723	0.5	0.5	2.6	6	6	5.5	6.2	7.1	6.8	10.2
Phase I	225	208.81	6	725	0.5	0.5	3.1	4.7	4.6	4.7	5.7	6.3	5	7.9
Phase I	225	238.42	6	732	0.5	0.5	0.5	2.3	2.6	4.2	6.2	6.1	4.8	6.8
Phase I	225	254.82	6	737	0.5	0.5	1.3	1.9	4.1	5.3	5.4	6.9	6	5.1
Fe/Mn/PbO	25	25.37	7	707	0.5	Missing	0.5	2.7	2.2	1.9	2	3	1.5	1.5
Fe/Mn/PbO	25	25.47	7	713	0.5	0.5	0.5	0.5	1.3	0.5	0.5	0.5	1.2	1.4
Fe/Mn/PbO	25	25.65	7	730	0.5	0.5	0.5	0.5	0.5	1.1	2.2	3	2	3.3
Fe/Mn/PbO	25	23.80	7	738	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1.1
Fe/Mn/PbO	25	26.30	7	741	0.5	0.5	0.5	1	0.5	1	0.5	2.2	1	2.7
Fe/Mn/PbO	75	75.08	8	733	0.5	0.5	0.5	1.9	1.2	1.2	2	3.6	2.8	3.6
Fe/Mn/PbO	75	86.46	8	742	0.5	0.5	0.5	0.5	0.5	1.7	1.4	2.5	1.9	3.5
Fe/Mn/PbO	75	79.50	8	746	0.5	0.5	0.5	0.5	1	2.5	2.5	3.4	1.5	4.3
Fe/Mn/PbO	75	71.40	8	749	0.5	0.5	0.5	0.5	0.5	0.5	1.6	2.4	2	3.8
Fe/Mn/PbO	75	68.77	8	751	0.5	0.5	1.6	1.7	2	3.6	3	4.1	4.4	6.5
Fe/Mn/PbO	225	215.68	9	719	0.5	0.5	1.4	4.5	3.8	4	6.1	6.5	7	9.4
Fe/Mn/PbO	225	237.34	9	721	0.5	0.5	2.9	7.3	5.8	10.7	7.9	9.5	6.8	10
Fe/Mn/PbO	225	199.45	9	729	0.5	0.5	3	3.7	6.9	8.3	8.5	10.1	10.5	10.8
Fe/Mn/PbO	225	240.58	9	744	0.5	0.5	2.2	4.6	5.6	5.6	6.2	6.7	7	8.4
Fe/Mn/PbO	225	263.25	9	745	0.5	0.5	2.2	5.6	5.8	6.3	7.2	6.9	9.3	8.1
IV	100	91.02	10	722	1.1	0.5	11.5	12.2	13.3	15.6	18.1	20	16.2	17.9
IV	100	129.79	10	724	0.5	0.5	11.8	15	13.5	17.7	16.7	21	16.5	16.7
IV	100	92.85	10	727	0.5	0.5	15.9	20.8	18.8	19.9	23.3	24.2	21.9	23.3
IV	100	107.56	10	734	0.5	0.5	7.7	9.2	9.6	11.1	13.3	12.5	12.1	13.1
IV	100	98.61	10	754	0.5	2.6	8.9	11.9	14.3	14.5	15.8	17.9	10.7	11.3

*** Average Time and Weight-Adjusted Dose for Each Pig**

Missing values are a result of clotting in the whole blood, preventing accurate preparation of diluted samples.

TABLE A-5 RATIONALE FOR PbB OUTLIER DECISIONS

OUTLIER	IDENTIFICATION	RATIONALE
1	Day 0 Group 2 Pig # 750	Based on comparison with responses by other animals in this group on this day, the response of animal 750 is significantly higher. In addition, it is significantly higher than the value obseved in the same animal one day earlier. Therefore, this value is excluded and replaced with an interpolated value of 0.5 ug/dL.
2	Day 9 Group 6 Pig # 717	Based on comparison with responses by other animals in this group on this day, the response of animal 717 is significantly lower. In addition, it is significantly lower than the value obseved in the same animal one day earlier. Therefore, this value is excluded and replaced with an interpolated value of 5.45 ug/dL.

TABLE A-6 Area Under Curve Determinations

Calculated using interpolated values for missing or excluded data as noted in Table A-5

		AUC (ug/dL-days) For Time Span Shown								AUC Total
group	pig#	0-1	1-2	2-3	3-5	5-7	7-9	9-12	12-15	(ug/dL-days)
1	706	0.50	0.50	0.50	1.00	1.00	1.00	1.50	1.50	7.50
1	714	0.50	0.50	0.50	1.00	1.00	1.00	1.50	1.50	7.50
1	718	0.50	0.50	0.50	1.00	1.00	1.00	1.50	1.50	7.50
1	735	0.50	0.50	0.50	1.00	1.00	2.00	3.00	1.50	10.00
1	743	0.50	0.50	0.50	1.00	1.00	1.00	1.50	1.50	7.50
2	703	0.50	0.50	0.50	1.00	1.00	2.30	3.45	1.50	10.75
2	709	0.50	0.50	0.50	1.00	1.00	1.00	1.50	1.50	7.50
2	748	0.50	0.50	0.50	1.00	1.50	2.00	3.15	2.40	11.55
2	750	0.50	0.50	0.50	1.00	1.00	2.00	5.55	6.45	17.50
2	755	0.50	0.50	0.50	2.30	3.80	4.70	8.10	9.00	29.40
3	711	0.50	0.85	0.85	1.00	2.40	4.20	5.55	6.45	21.80
3	715	0.50	0.50	0.50	2.20	3.30	5.10	6.00	3.90	22.00
3	716	0.50	1.40	2.10	7.20	10.90	12.10	31.35	40.95	106.50
3	747	0.95	1.95	2.40	5.30	6.40	7.60	9.90	10.95	45.45
3	731	0.50	1.15	2.05	5.00	6.50	9.60	14.25	11.85	50.90
4	704	0.50	0.50	0.50	1.00	1.00	2.00	3.00	1.50	10.00
4	712	0.50	0.50	0.50	1.00	1.60	3.00	3.60	1.50	12.20
4	736	0.50	0.50	0.50	1.00	1.00	1.00	1.50	1.50	7.50
4	740	0.50	0.50	0.50	1.00	1.00	2.60	3.90	1.50	11.50
4	753	0.50	0.50	0.50	1.00	1.00	1.80	2.70	4.65	12.65
5	702	0.50	0.50	0.80	2.20	2.70	4.20	7.80	9.45	28.15
5	708	0.50	1.40	2.15	5.00	5.70	7.00	11.10	9.75	42.60
5	728	0.85	2.00	2.65	6.20	7.40	7.60	9.00	8.40	44.10
5	739	0.50	0.75	2.00	4.10	3.00	4.00	7.65	11.25	33.25
5	756	0.50	0.85	1.35	4.70	6.20	6.50	10.35	10.05	40.50
6	717	1.15	3.80	5.60	13.80	14.50	11.55	15.38	16.80	82.58
6	723	1.55	4.30	6.00	11.50	11.70	13.30	20.85	25.50	94.70
6	725	1.80	3.90	4.65	9.30	10.40	12.00	16.95	19.35	78.35
6	732	0.50	1.40	2.45	6.80	10.40	12.30	16.35	17.40	67.60
6	737	0.90	1.60	3.00	9.40	10.70	12.30	19.35	16.65	73.90
7	707	0.50	1.60	2.45	4.10	3.90	5.00	6.75	4.50	28.80
7	713	0.50	0.50	0.90	1.80	1.00	1.00	2.55	3.90	12.15
7	730	0.50	0.50	0.50	1.60	3.30	5.20	7.50	7.95	27.05
7	738	0.50	0.50	0.50	1.00	1.00	1.00	1.50	2.40	8.40
7	741	0.50	0.75	0.75	1.50	1.50	2.70	4.80	5.55	18.05
8	733	0.50	1.20	1.55	2.40	3.20	5.60	9.60	9.60	33.65
8	742	0.50	0.50	0.50	2.20	3.10	3.90	6.60	8.10	25.40
8	746	0.50	0.50	0.75	3.50	5.00	5.90	7.35	8.70	32.20
8	749	0.50	0.50	0.50	1.00	2.10	4.00	6.60	8.70	23.90
8	751	1.05	1.65	1.85	5.60	6.60	7.10	12.75	16.35	52.95
9	719	0.95	2.95	4.15	7.80	10.10	12.60	20.25	24.60	83.40
9	721	1.70	5.10	6.55	16.50	18.60	17.40	24.45	25.20	115.50
9	729	1.75	3.35	5.30	15.20	16.80	18.60	30.90	31.95	123.85
9	744	1.35	3.40	5.10	11.20	11.80	12.90	20.55	23.10	89.40
9	745	1.35	3.90	5.70	12.10	13.50	14.10	24.30	26.10	101.05
10	722	6.00	11.85	12.75	28.90	33.70	38.10	54.30	51.15	236.75
10	724	6.15	13.40	14.25	31.20	34.40	37.70	56.25	49.80	243.15
10	727	8.20	18.35	19.80	38.70	43.20	47.50	69.15	67.80	312.70
10	734	4.10	8.45	9.40	20.70	24.40	25.80	36.90	37.80	167.55
10	754	5.75	10.40	13.10	28.80	30.30	33.70	42.90	33.00	197.95

TABLE A - 7 TISSUE LEAD DATA

PHASE II EXPERIMENT 7

pig number	sample	group	material administered	dosage	qualifier	lab result (ug/L)	day	source file	MATRIX	Adjusted Value[a]	Notes
706	8-970839	1	control	0	<	2	15	T960131F	FEMUR	0.5	
714	8-970854	1	control	0		1.5	15	T960131F	FEMUR	0.75	
718	8-970833	1	control	0	<	2	15	T960131F	FEMUR	0.5	
735	8-970871	1	control	0		1.1	15	T960131F	FEMUR	0.55	
743	8-970863	1	control	0		2.9	15	T960131F	FEMUR	1.45	
703	8-970832	2	PbAc	25	<	2	15	T960131F	FEMUR	0.5	
709	8-970872	2	PbAc	25		1.6	15	T960131F	FEMUR	0.8	
748	8-970840	2	PbAc	25		3.8	15	T960131F	FEMUR	1.9	
750	8-970870	2	PbAc	25		6.6	15	T960131F	FEMUR	3.3	
755	8-970868	2	PbAc	25		8	15	T960131F	FEMUR	4	
711	8-970825	3	PbAc	75		9.6	15	T960131F	FEMUR	4.8	
715	8-970845	3	PbAc	75		6.9	15	T960131F	FEMUR	3.45	
716	8-970862	3	PbAc	75		30.3	15	T960131F	FEMUR	15.15	
747	8-970842	3	PbAc	75		12.2	15	T960131F	FEMUR	6.1	
731	8-970874	3	PbAc	75		10.1	15	T960131F	FEMUR	5.05	
704	8-970837	4	Phase I	25		2.4	15	T960131F	FEMUR	1.2	
712	8-970841	4	Phase I	25		3.6	15	T960131F	FEMUR	1.8	
736	8-970869	4	Phase I	25		7.1	15	T960131F	FEMUR	3.55	
740	8-970846	4	Phase I	25	<	2	15	T960131F	FEMUR	0.5	
753	8-970875	4	Phase I	25		2.7	15	T960131F	FEMUR	1.35	
702	8-970849	5	Phase I	75		6.5	15	T960131F	FEMUR	3.25	
708	8-970873	5	Phase I	75		6.1	15	T960131F	FEMUR	3.05	
728	8-970865	5	Phase I	75		10.1	15	T960131F	FEMUR	5.05	
739	8-970824	5	Phase I	75		6.3	15	T960131F	FEMUR	3.15	
756	8-970848	5	Phase I	75		5.2	15	T960131F	FEMUR	2.6	
717	8-970876	6	Phase I	225		17	15	T960131F	FEMUR	8.5	
723	8-970859	6	Phase I	225		18.9	15	T960131F	FEMUR	9.45	
725	8-970857	6	Phase I	225		14.3	15	T960131F	FEMUR	7.15	
732	8-970828	6	Phase I	225		15.6	15	T960131F	FEMUR	7.8	
737	8-970831	6	Phase I	225		15.2	15	T960131F	FEMUR	7.6	
707	8-970861	7	Fe/Mn PbO	25		11.2	15	T960131F	FEMUR	5.6	
713	8-970853	7	Fe/Mn PbO	25		4	15	T960131F	FEMUR	2	
730	8-970836	7	Fe/Mn PbO	25		8.9	15	T960131F	FEMUR	4.45	
738	8-970834	7	Fe/Mn PbO	25		3.4	15	T960131F	FEMUR	1.7	
741	8-970860	7	Fe/Mn PbO	25		4	15	T960131F	FEMUR	2	
733	8-970864	8	Fe/Mn PbO	75		8.1	15	T960131F	FEMUR	4.05	
742	8-970852	8	Fe/Mn PbO	75		6.4	15	T960131F	FEMUR	3.2	
746	8-970838	8	Fe/Mn PbO	75		7.8	15	T960131F	FEMUR	3.9	
749	8-970856	8	Fe/Mn PbO	75		9.4	15	T960131F	FEMUR	4.7	
751	8-970850	8	Fe/Mn PbO	75		12	15	T960131F	FEMUR	6	
719	8-970847	9	Fe/Mn PbO	225		20.5	15	T960131F	FEMUR	10.25	
721	8-970843	9	Fe/Mn PbO	225		16.6	15	T960131F	FEMUR	8.3	
729	8-970827	9	Fe/Mn PbO	225		28.2	15	T960131F	FEMUR	14.1	
744	8-970826	9	Fe/Mn PbO	225		23.4	15	T960131F	FEMUR	11.7	
745	8-970866	9	Fe/Mn PbO	225		23.6	15	T960131F	FEMUR	11.8	
722	8-970855	10	IV	100		105	15	T960131F	FEMUR	52.5	
724	8-970851	10	IV	100		84	15	T960131F	FEMUR	42	
727	8-970829	10	IV	100		86	15	T960131F	FEMUR	43	
734	8-970835	10	IV	100		113	15	T960131F	FEMUR	56.5	
754	8-970858	10	IV	100		84.2	15	T960131F	FEMUR	42.1	
706	8-970785	1	control	0	<	2	15	T960106K	KIDNEY	10	
714	8-970797	1	control	0	<	2	15	T960106K	KIDNEY	10	
718	8-970821	1	control	0	<	2	15	T960106K	KIDNEY	10	
735	8-970814	1	control	0	<	2	15	T960106K	KIDNEY	10	
743	8-970772	1	control	0	<	2	15	T960106K	KIDNEY	10	
703	8-970786	2	PbAc	25		2.9	15	T960106K	KIDNEY	29	
709	8-970817	2	PbAc	25	<	2	15	T960106K	KIDNEY	10	
748	8-970823	2	PbAc	25		2.9	15	T960106K	KIDNEY	29	
750	8-970791	2	PbAc	25		16.2	15	T960106K	KIDNEY	162	
755	8-970799	2	PbAc	25		8.3	15	T960106K	KIDNEY	83	
711	8-970787	3	PbAc	75		12	15	T960106K	KIDNEY	120	
715	8-970805	3	PbAc	75		5.7	15	T960106K	KIDNEY	57	
716	8-970800	3	PbAc	75		59.5	15	T960106K	KIDNEY	595	
747	8-970782	3	PbAc	75		14.3	15	T960106K	KIDNEY	143	
731	8-970793	3	PbAc	75		10.4	15	T960106K	KIDNEY	104	
704	8-970812	4	Phase I	25	<	2	15	T960106K	KIDNEY	10	
712	8-970778	4	Phase I	25		3.9	15	T960106K	KIDNEY	39	
736	8-970775	4	Phase I	25		2.7	15	T960106K	KIDNEY	27	
740	8-970774	4	Phase I	25		3.5	15	T960106K	KIDNEY	35	
753	8-970819	4	Phase I	25		4.6	15	T960106K	KIDNEY	46	
702	8-970822	5	Phase I	75		13.8	15	T960106K	KIDNEY	138	
708	8-970776	5	Phase I	75		8.9	15	T960106K	KIDNEY	89	
728	8-970813	5	Phase I	75		6.7	15	T960106K	KIDNEY	67	
739	8-970792	5	Phase I	75		12.4	15	T960106K	KIDNEY	124	
756	8-970794	5	Phase I	75		7.4	15	T960106K	KIDNEY	74	
717	8-970779	6	Phase I	225		28.6	15	T960106K	KIDNEY	286	
723	8-970795	6	Phase I	225		30	15	T960106K	KIDNEY	300	
725	8-970803	6	Phase I	225		28.7	15	T960106K	KIDNEY	287	
732	8-970781	6	Phase I	225		23.2	15	T960106K	KIDNEY	232	
737	8-970777	6	Phase I	225		21.6	15	T960106K	KIDNEY	216	
707	8-970806	7	Fe/Mn PbO	25		5.4	15	T960106K	KIDNEY	54	
713	8-970807	7	Fe/Mn PbO	25		3.7	15	T960106K	KIDNEY	37	
730	8-970801	7	Fe/Mn PbO	25		6.6	15	T960106K	KIDNEY	66	
738	8-970789	7	Fe/Mn PbO	25		3.8	15	T960106K	KIDNEY	38	
741	8-970788	7	Fe/Mn PbO	25		7.7	15	T960106K	KIDNEY	77	
733	8-970773	8	Fe/Mn PbO	75		12.9	15	T960106K	KIDNEY	129	
742	8-970780	8	Fe/Mn PbO	75		12.5	15	T960106K	KIDNEY	125	
746	8-970811	8	Fe/Mn PbO	75		14.8	15	T960106K	KIDNEY	148	

pig number	sample	group	material administered	dosage	qualifier	lab result (ug/L)	day	source file	MATRIX	Adjusted Value[a]	Notes
749	8-970784	8	Fe/Mn PbO	75		14.2	15	T960106K	KIDNEY	142	
751	8-970808	8	Fe/Mn PbO	75		20	15	T960106K	KIDNEY	200	
719	8-970818	9	Fe/Mn PbO	225		35.6	15	T960106K	KIDNEY	356	
721	8-970816	9	Fe/Mn PbO	225		31.4	15	T960106K	KIDNEY	314	
729	8-970771	9	Fe/Mn PbO	225		49.6	15	T960106K	KIDNEY	496	
744	8-970820	9	Fe/Mn PbO	225		39.9	15	T960106K	KIDNEY	399	
745	8-970802	9	Fe/Mn PbO	225		43.6	15	T960106K	KIDNEY	436	
722	8-970804	10	IV	100		124	15	T960106K	KIDNEY	1240	
724	8-970815	10	IV	100		126	15	T960106K	KIDNEY	1260	
727	8-970783	10	IV	100		107	15	T960106K	KIDNEY	1070	
734	8-970810	10	IV	100		106	15	T960106K	KIDNEY	1060	
754	8-970790	10	IV	100		124	15	T960106K	KIDNEY	1240	
706	8-970762	1	control	0	<	2	15	T960106L	LIVER	10	
714	8-970752	1	control	0	<	2	15	T960106L	LIVER	10	
718	8-970729	1	control	0	<	2	15	T960106L	LIVER	10	
735	8-970755	1	control	0	<	2	15	T960106L	LIVER	10	
743	8-970720	1	control	0	<	2	15	T960106L	LIVER	10	
703	8-970724	2	PbAc	25		2.7	15	T960106L	LIVER	27	
709	8-970736	2	PbAc	25		3	15	T960106L	LIVER	30	
748	8-970753	2	PbAc	25		4.5	15	T960106L	LIVER	45	
750	8-970738	2	PbAc	25		13.4	15	T960106L	LIVER	134	
755	8-970721	2	PbAc	25		11.3	15	T960106L	LIVER	113	
711	8-970726	3	PbAc	75		9.2	15	T960106L	LIVER	92	
715	8-970766	3	PbAc	75		8.1	15	T960106L	LIVER	81	
716	8-970718	3	PbAc	75		68.1	15	T960106L	LIVER	681	
747	8-970742	3	PbAc	75		21.2	15	T960106L	LIVER	212	
731	8-970731	3	PbAc	75		10.7	15	T960106L	LIVER	107	
704	8-970735	4	Phase I	25		2	15	T960106L	LIVER	20	
712	8-970733	4	Phase I	25		6.9	15	T960106L	LIVER	69	
736	8-970744	4	Phase I	25		4.2	15	T960106L	LIVER	42	
740	8-970746	4	Phase I	25		2.7	15	T960106L	LIVER	27	
753	8-970719	4	Phase I	25		7.3	15	T960106L	LIVER	73	
702	8-970749	5	Phase I	75		12.6	15	T960106L	LIVER	126	
708	8-970722	5	Phase I	75		9.8	15	T960106L	LIVER	98	
728	8-970759	5	Phase I	75		9.8	15	T960106L	LIVER	98	
739	8-970723	5	Phase I	75		10.1	15	T960106L	LIVER	101	
756	8-970758	5	Phase I	75		8	15	T960106L	LIVER	80	
717	8-970756	6	Phase I	225		33.8	15	T960106L	LIVER	338	
723	8-970734	6	Phase I	225		37.4	15	T960106L	LIVER	374	
725	8-970747	6	Phase I	225		36.5	15	T960106L	LIVER	365	
732	8-970727	6	Phase I	225		21	15	T960106L	LIVER	210	
737	8-970751	6	Phase I	225		29.5	15	T960106L	LIVER	295	
707	8-970757	7	Fe/Mn PbO	25		6.5	15	T960106L	LIVER	65	
713	8-970745	7	Fe/Mn PbO	25		4.2	15	T960106L	LIVER	42	
730	8-970750	7	Fe/Mn PbO	25		5.2	15	T960106L	LIVER	52	
738	8-970743	7	Fe/Mn PbO	25		3.5	15	T960106L	LIVER	35	
741	8-970754	7	Fe/Mn PbO	25		5.8	15	T960106L	LIVER	58	
733	8-970760	8	Fe/Mn PbO	75		8.5	15	T960106L	LIVER	85	
742	8-970728	8	Fe/Mn PbO	75		11.7	15	T960106L	LIVER	117	
746	8-970748	8	Fe/Mn PbO	75		8.8	15	T960106L	LIVER	88	
749	8-970761	8	Fe/Mn PbO	75		17.7	15	T960106L	LIVER	177	
751	8-970730	8	Fe/Mn PbO	75		24.2	15	T960106L	LIVER	242	
719	8-970737	9	Fe/Mn PbO	225		45.6	15	T960106L	LIVER	456	
721	8-970740	9	Fe/Mn PbO	225		25.8	15	T960106L	LIVER	258	
729	8-970732	9	Fe/Mn PbO	225		56.6	15	T960106L	LIVER	566	
744	8-970764	9	Fe/Mn PbO	225		30	15	T960106L	LIVER	300	
745	8-970769	9	Fe/Mn PbO	225		39.7	15	T960106L	LIVER	397	
722	8-970725	10	IV	100		154	15	T960106L	LIVER	1540	
724	8-970767	10	IV	100		259	15	T960106L	LIVER	2590	
727	8-970763	10	IV	100		152	15	T960106L	LIVER	1520	
734	8-970770	10	IV	100		169	15	T960106L	LIVER	1690	
754	8-970741	10	IV	100		148	15	T960106L	LIVER	1480	

a Non-detects evaluated using 1/2 the quantitation limit. Laboratory results (ug/L) converted to tissue concentrations by dividing by sample dilution factors of 0.1 kg/L (liver, kidney) or 2 g/L (ashed bone). Final units are ug Pb/kg wet weight (liver, kidney) or ug Pb/g ashed bone (femur).

TABLE A-8 SUMMARY OF ENDPOINT OUTLIERS

Selected Outliers

test material	target dosage	Actual Dose*	group	pig#	MEASUREMENT ENDPOINT Blood	Femur	Liver	Kidney
control	0	0.00	1	706	7.5	0.5	10	10
control	0	0.00	1	714	7.5	0.75	10	10
control	0	0.00	1	718	7.5	0.5	10	10
control	0	0.00	1	735	10.0	0.55	10	10
control	0	0.00	1	743	7.5	1.45	10	10
PbAc	25	29.54	2	703	10.8	0.5	27	29
PbAc	25	35.21	2	709	7.5	0.8	30	10
PbAc	25	23.82	2	748	11.6	1.9	45	29
PbAc	25	21.66	2	750	17.5	3.3	134	162
PbAc	25	23.35	2	755	29.4	4	113	83
PbAc	75	69.07	3	711	21.8	4.8	92	120
PbAc	75	78.87	3	715	22.0	3.45	81	57
PbAc	75	67.65	3	716	106.5 b	15.15 b	681 b	595 b
PbAc	75	77.43	3	747	45.5	6.1	212	143
PbAc	75	75.18	3	731	50.9	5.05	107	104
Phase I	25	29.36	4	704	10.0	1.2	20	10
Phase I	25	25.29	4	712	12.2	1.8	69	39
Phase I	25	23.17	4	736	7.5	3.55	42	27
Phase I	25	28.74	4	740	11.5	0.5	27	35
Phase I	25	23.81	4	753	12.7	1.35	73	46
Phase I	75	87.72	5	702	28.2	3.25	126	138
Phase I	75	73.55	5	708	42.6	3.05	98	89
Phase I	75	66.81	5	728	44.1	5.05 b	98	67
Phase I	75	88.29	5	739	33.3	3.15	101	124
Phase I	75	73.29	5	756	40.5	2.6	80	74
Phase I	225	222.95	6	717	82.6	8.5	338	286
Phase I	225	241.21	6	723	94.7	9.45	374	300
Phase I	225	208.81	6	725	78.4	7.15	365	287
Phase I	225	238.42	6	732	67.6	7.8	210 b	232
Phase I	225	254.82	6	737	73.9	7.6	295	216 b
Fe/Mn/PbO	25	25.37	7	707	28.8	5.6	65	54
Fe/Mn/PbO	25	25.47	7	713	12.2	2	42	37
Fe/Mn/PbO	25	25.65	7	730	27.1	4.45	52	66
Fe/Mn/PbO	25	23.80	7	738	8.4	1.7	35	38
Fe/Mn/PbO	25	26.30	7	741	18.1	2	58	77
Fe/Mn/PbO	75	75.08	8	733	33.7	4.05	85	129
Fe/Mn/PbO	75	86.46	8	742	25.4	3.2	117	125
Fe/Mn/PbO	75	79.50	8	746	32.2	3.9	88	148
Fe/Mn/PbO	75	71.40	8	749	23.9	4.7	177	142
Fe/Mn/PbO	75	68.77	8	751	53.0	6	242	200
Fe/Mn/PbO	225	215.68	9	719	83.4	10.25	456	356
Fe/Mn/PbO	225	237.34	9	721	115.5	8.3	258	314
Fe/Mn/PbO	225	199.45	9	729	123.9 b	14.1 b	566 b	496 b
Fe/Mn/PbO	225	240.58	9	744	89.4	11.7	300	399
Fe/Mn/PbO	225	263.25	9	745	101.1	11.8	397	436
IV	100	91.02	10	722	236.8	52.5	1540	1240
IV	100	129.79	10	724	243.2	42	2590	1260
IV	100	92.85	10	727	312.7	43	1520	1070
IV	100	107.56	10	734	167.6	56.5	1690	1060
IV	100	98.61	10	754	198.0	42.1	1480	1240

a *a priori* outlier determinations (none selected)
b Outside 95% Prediction Interval

TABLE A-9 Best Curve Fit Parameters

BLOOD

PbAc Curve -	Exp
a	6.2
b	
c	138.6
d	0.0045
R2	0.258

Phase I Curve -	Exp
a	6.2
b	
c	138.6
d	0.0032
R2	0.929

FeMnPbO Curve -	Exp
a	6.2
b	
c	138.6
d	0.0039
R2	0.9

BONE

PbAc Curve -	Linear
a	1
b	0.0484
c	
d	
R2	0.632

Phase I Curve -	Linear
a	1
b	0.0298
c	
d	
R2	0.932

FeMnPbO Curve -	Linear
a	1
b	0.0407
c	
d	
R2	0.858

LIVER

PbAc Curve -	Linear
a	15.3
b	1.482
c	
d	
R2	0.465

Phase I Curve -	Linear
a	15.3
b	1.358
c	
d	
R2	0.942

FeMnPbO Curve -	Linear
a	15.3
b	1.421
c	
d	
R2	0.833

KIDNEY

PbAc Curve -	Linear
a	15.1
b	1.233
c	
d	
R2	0.359

Phase I Curve -	Linear
a	15.1
b	1.127
c	
d	
R2	0.954

FeMnPbO Curve -	Linear
a	15.1
b	1.535
c	
d	
R2	0.961

Equations Used

EXP Y=a+c*(1-exp(-d*dose))

LIN Y=a+b*dose

TABLE A-10 Relative Bioavailability of Lead in Test Materials

Endpoint	Test Material	
	Phase I	FeMnPbO
Blood	0.71	0.87
Kidney	0.91	1.24
Liver	0.92	0.96
Bone	0.62	0.84

Definitions

Plausible Range:	RBA(Blood) to mean RBA for Tissues
Preferred Range:	RBA(Blood) to (RBA(Blood) + RBA(Tissues))/2
Suggested Point Est:	1/2(RBA(Blood) + (RBA(Blood)+RBA(Tissues))/2)

Relative Bioavailability

	Phase I		FeMnPbO	
Plausible Range	0.71	0.82	0.87	1.01
Preferred Range	0.71	0.76	0.87	0.94
Point Estimate	0.74		0.90	

Absolute Bioavailability

	Phase I		FeMnPbO	
Plausible Range	36%	41%	43%	51%
Preferred Range	36%	38%	43%	47%
Point Estimate	37%		45%	

TABLE A-11 INTRALABORATORY DUPLICATES

RPD = Relative Percent Difference
RPD = 100*[Orig-Dup]/((Orig+Dup)/2

* Non detects evaluated at 1/2 DL

Pig number	group	material administered	dosage	day	matrix	Duplicate Value*	Original Value*	Average	RPD	Avg RPD	
704	4	Phase I	25	-4	BLOOD	0.5	0.5	0.5	0%		
724	10	IV	100	-4	BLOOD	0.5	0.5	0.5	0%		
734	10	IV	100	-4	BLOOD	0.5	0.5	0.5	0%		
704	4	Phase I	25	0	BLOOD	0.5	0.5	0.5	0%		
724	10	IV	100	0	BLOOD	0.5	0.5	0.5	0%		
734	10	IV	100	0	BLOOD	0.5	0.5	0.5	0%		
704	4	Phase I	25	1	BLOOD	0.5	0.5	0.5	0%		
724	10	IV	100	1	BLOOD	12.2	11.8	12	-3%		
734	10	IV	100	1	BLOOD	8.2	7.7	7.95	-6%		
704	4	Phase I	25	2	BLOOD	0.5	0.5	0.5	0%		
724	10	IV	100	2	BLOOD	17.3	15	16.15	-14%		
734	10	IV	100	2	BLOOD	11.3	9.2	10.25	-20%		
704	4	Phase I	25	3	BLOOD	0.5	0.5	0.5	0%		
724	10	IV	100	3	BLOOD	13.7	13.5	13.6	-1%		
734	10	IV	100	3	BLOOD	9.4	9.6	9.5	2%		
704	4	Phase I	25	5	BLOOD	0.5	0.5	0.5	0%		
724	10	IV	100	5	BLOOD	16.8	17.7	17.25	5%		
734	10	IV	100	5	BLOOD	9.3	11.1	10.2	18%		
704	4	Phase I	25	7	BLOOD	0.5	0.5	0.5	0%		
724	10	IV	100	7	BLOOD	18.6	16.7	17.65	-11%		
734	10	IV	100	7	BLOOD	14.7	13.3	14	-10%		
704	4	Phase I	25	9	BLOOD	0.5	1.5	1	100%		
724	10	IV	100	9	BLOOD	20.3	21	20.65	3%		
734	10	IV	100	9	BLOOD	13.8	12.5	13.15	-10%		
704	4	Phase I	25	12	BLOOD	0.5	0.5	0.5	0%		
724	10	IV	100	12	BLOOD	16	16.5	16.25	3%		
734	10	IV	100	12	BLOOD	11.7	12.1	11.9	3%		
704	4	Phase I	25	15	BLOOD	0.5	0.5	0.5	0%		
724	10	IV	100	15	BLOOD	16.9	16.7	16.8	-1%		
734	10	IV	100	15	BLOOD	12.9	13.1	13	2%	2%	**BLOOD**
704	4	Phase I	25	15	FEMUR	1.85	1.2	1.525	-43%		
724	10	IV	100	15	FEMUR	52	42	47	-21%		
734	10	IV	100	15	FEMUR	52	56.5	54.25	8%	-19%	**FEMUR**
704	4	Phase I	25	15	KIDNEY	54	10	32	-138%		
724	10	IV	100	15	KIDNEY	1190	1260	1225	6%		
734	10	IV	100	15	KIDNEY	1060	1060	1060	0%	-44%	**KIDNEY**
704	4	Phase I	25	15	LIVER	10	20	15	67%		
724	10	IV	100	15	LIVER	2790	2590	2690	-7%		
734	10	IV	100	15	LIVER	1690	1690	1690	0%	20%	**LIVER**

TABLE A-12 CDC STANDARDS

Sample ID	Day	Q	Measured Low Std	Measured Med Std	Measured High Std	Nominal Conc
7.1	-4	<	1			1.7
7.1	0	<	1			1.7
7.1	1	<	1			1.7
7.1	3		5			1.7
7.1	9		1.1			1.7
7.2	-4			4.9		4.8
7.2	0			4.3		4.8
7.2	1			4.3		4.8
7.2	2			4.6		4.8
7.2	5			4.6		4.8
7.2	7			3.8		4.8
7.2	12			3.7		4.8
7.2	15			3.7		4.8
7.3	2				18.5	14.9
7.3	3				14.8	14.9
7.3	5				14.4	14.9
7.3	7				13	14.9
7.3	9				14.1	14.9
7.3	12				10.3	14.9
7.3	15				15.6	14.9
Averages			1.82	4.2	14.4	

TABLE A-13 INTERLABORATORY COMPARISON

Tag Number	Pig Number	Group	Material Administered	Dosage	Qualifier		Result			
					CDC	EPA	CDC	EPA	Average	RPD
8-970158	709	2	PbAc	25	U	<	0.6	1	0.8	50
8-970174	737	6	Phase I	225	U	<	0.6	1	0.8	50
8-970208	724	10	IV	100	U	<	0.6	1	0.8	50
8-970221	708	5	Phase I	75	U	<	0.6	1	0.8	50
8-970249	729	9	Fe/Mn PbO	225			4.8	3	3.9	-46
8-970265	738	7	Fe/Mn PbO	25		<	1	1	1	0
8-970313	751	8	Fe/Mn PbO	75			3.1	1.7	2.4	-58
8-970322	740	4	Phase I	25		<	0.8	1	0.9	22
8-970370	739	5	Phase I	75			4.2	3	3.6	-33
8-970378	752	3	PbAc	75			3.4	2.3	2.85	-39
8-970401	718	1	control	0		<	0.7	1	0.85	35
8-970445	753	4	Phase I	25		<	1.2	1	1.1	-18
8-970452	711	3	PbAc	75			2.4	1.9	2.15	-23
8-970457	730	7	Fe/Mn PbO	25			2.8	2.2	2.5	-24
8-970511	741	7	Fe/Mn PbO	25			3.3	2.2	2.75	-40
8-970551	752	3	PbAc	75			6.3	5.8	6.05	-8
8-970577	743	1	control	0	U	<	0.6	1	0.8	50
8-970600	747	3	PbAc	75			3.9	2.4	3.15	-48
8-970618	702	5	Phase I	75			4.5	3.7	4.1	-20
8-970643	716	3	PbAc	75			14.6	12.9	13.75	-12

FIGURE A-1 PbAc and IV Groups by Day
Raw Data

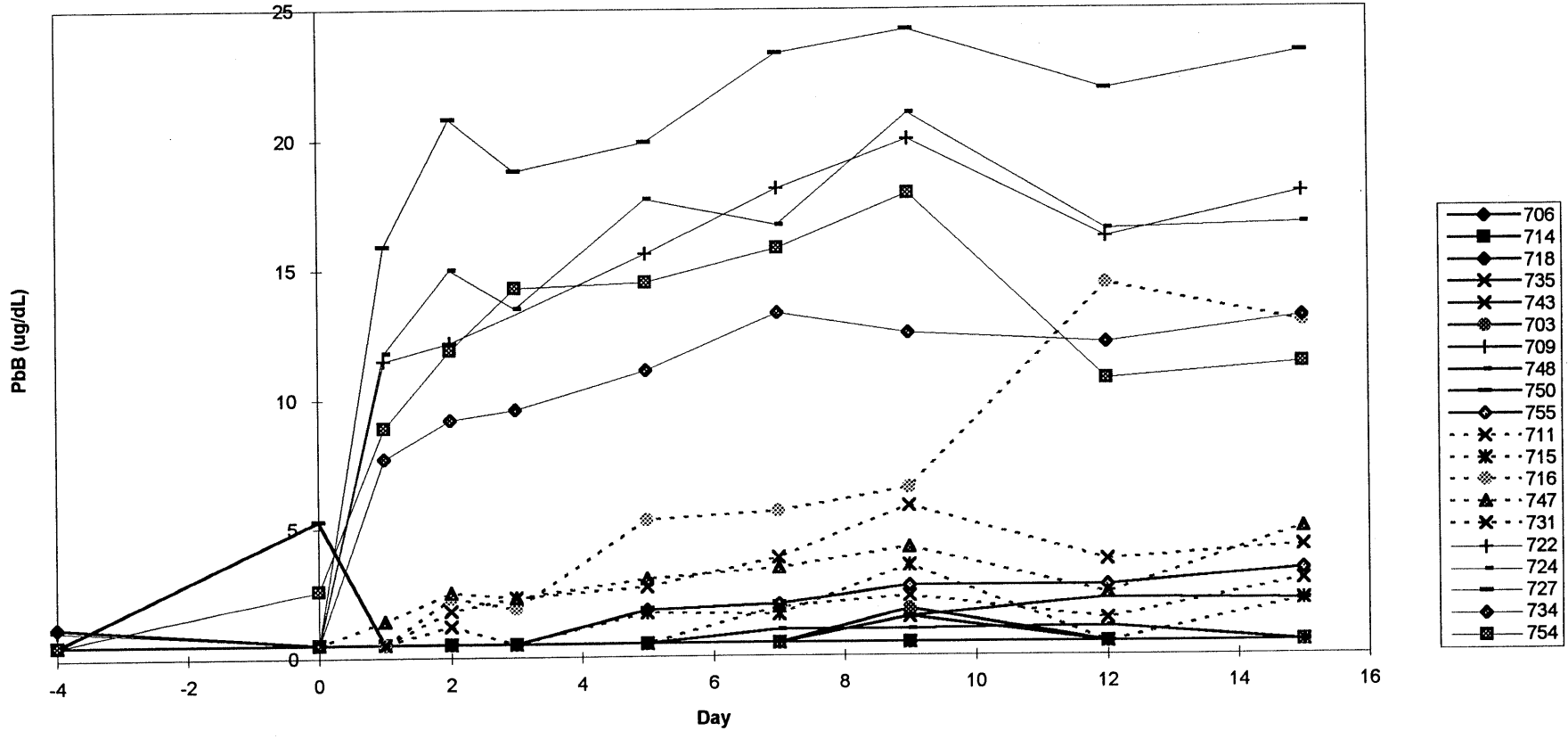


FIGURE A-2 Phase I Groups by Day
Raw Data

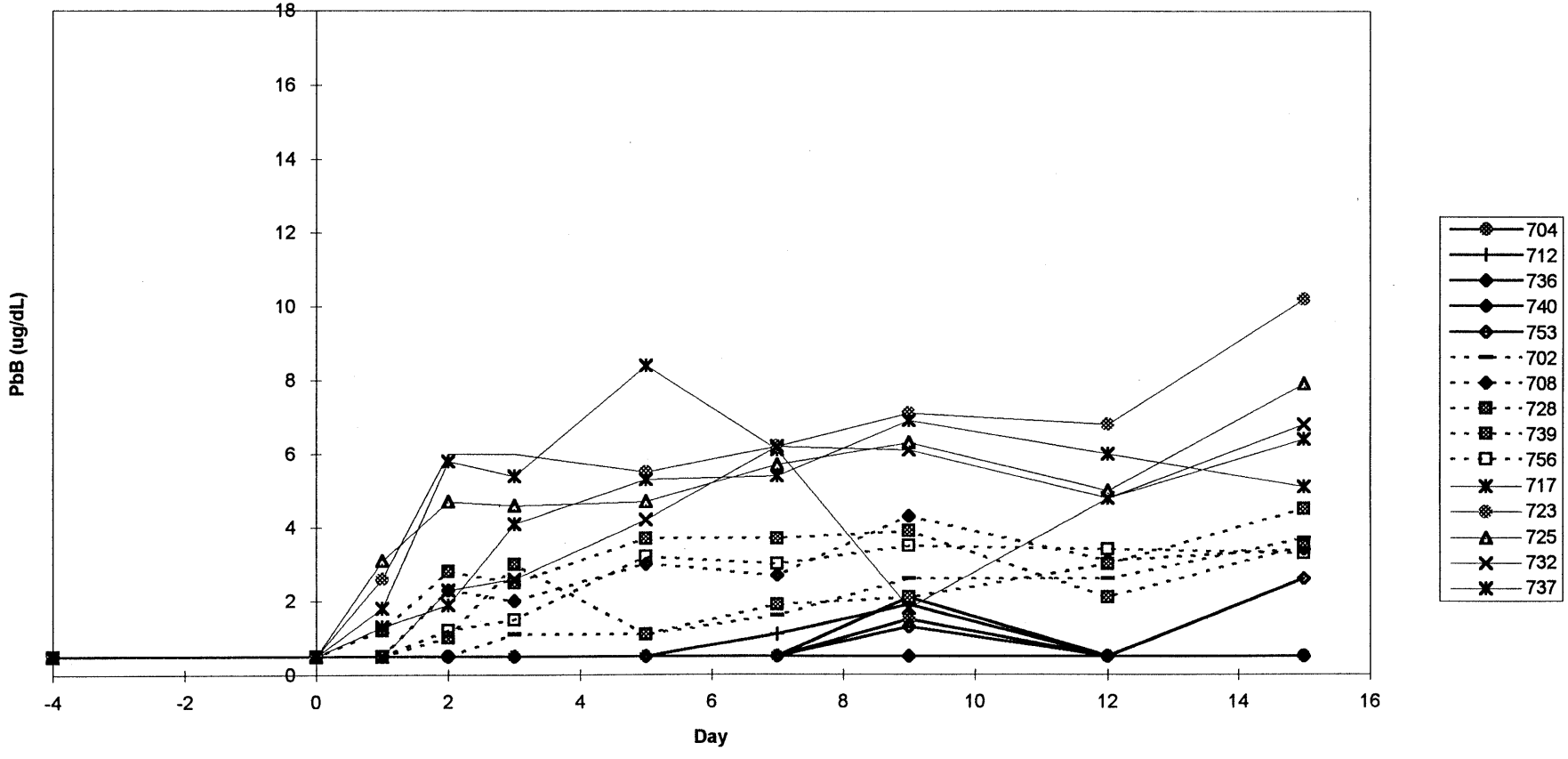


FIGURE A-3 FeMnPbO Groups by Day
Raw Data

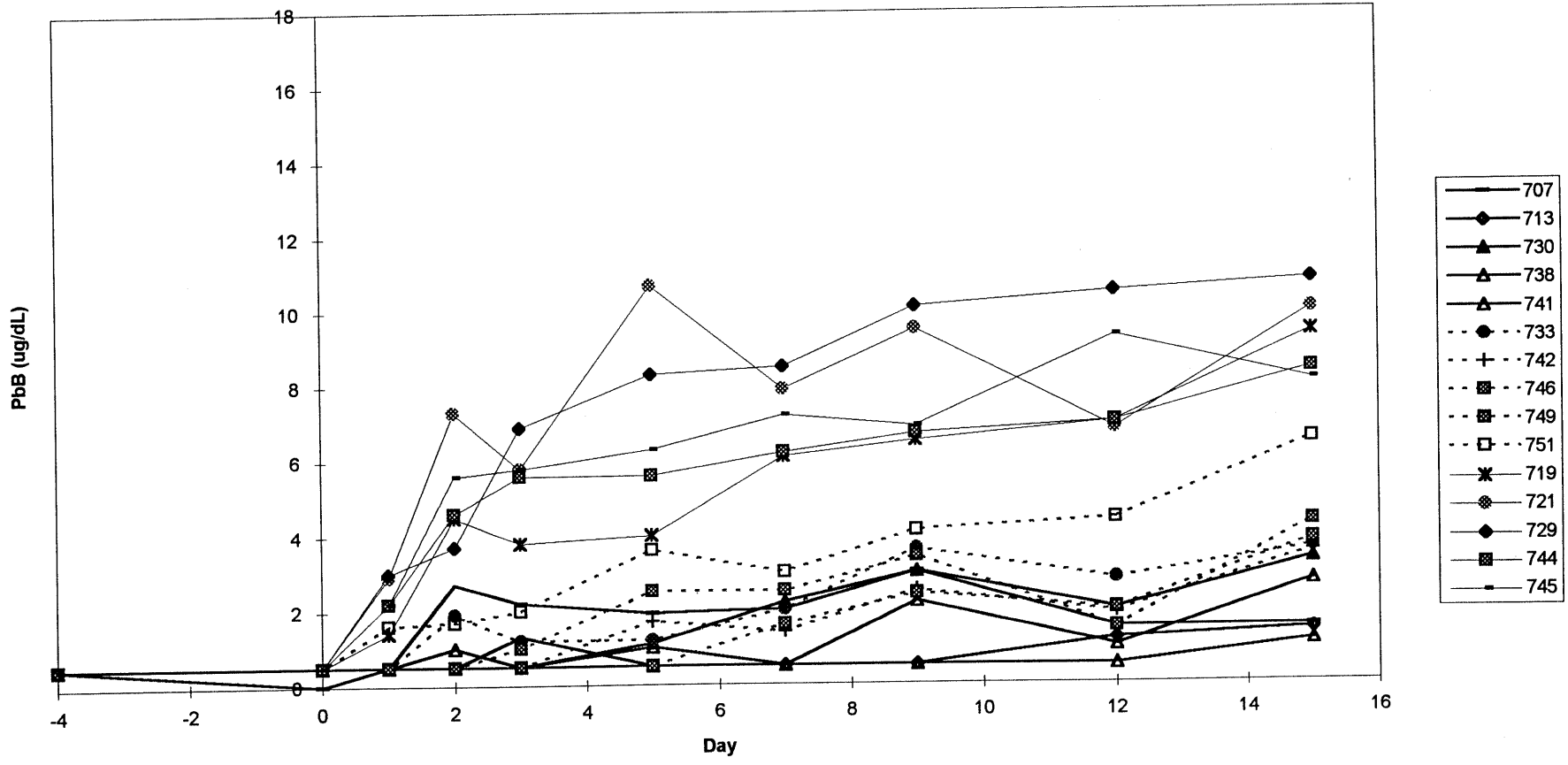


FIGURE A-4 Group Mean PbB By Day
Raw Data

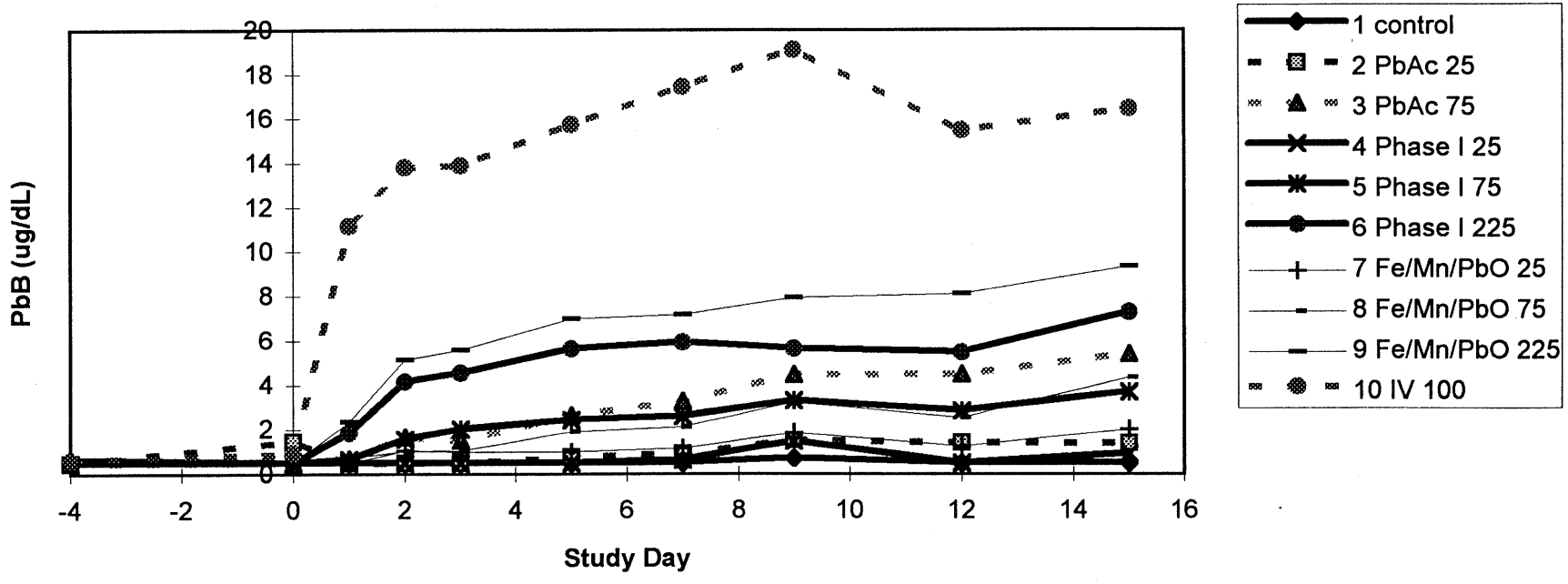
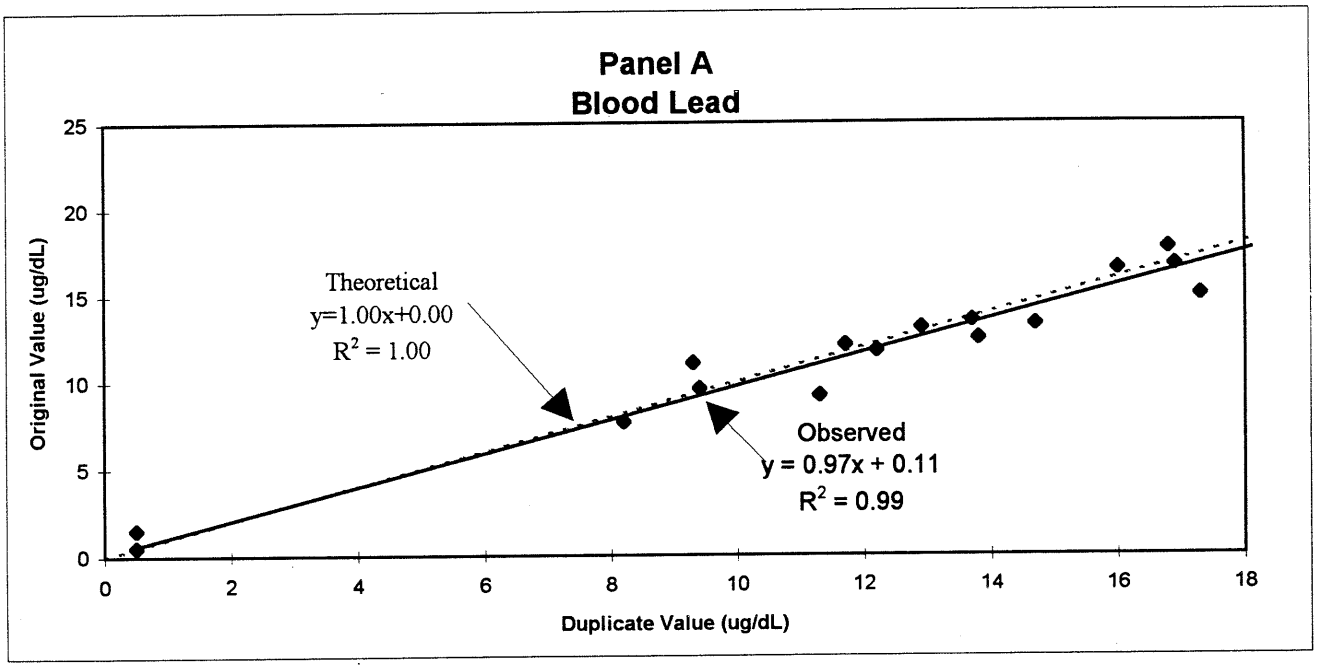
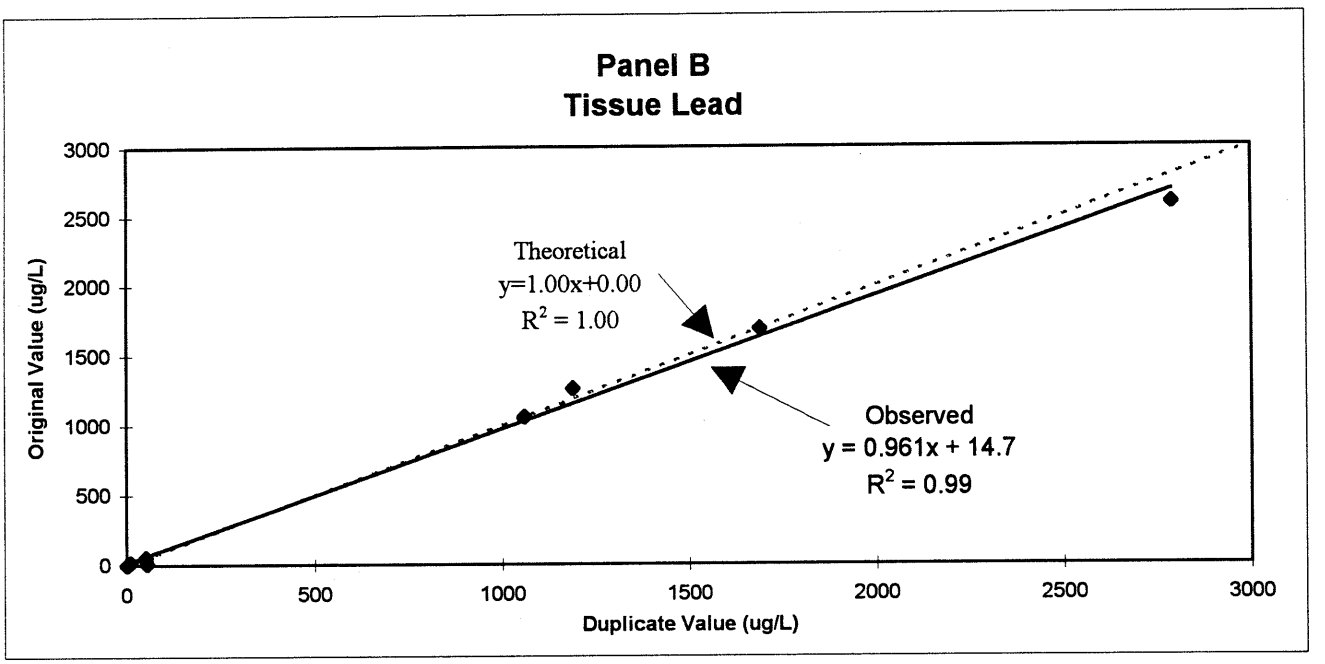


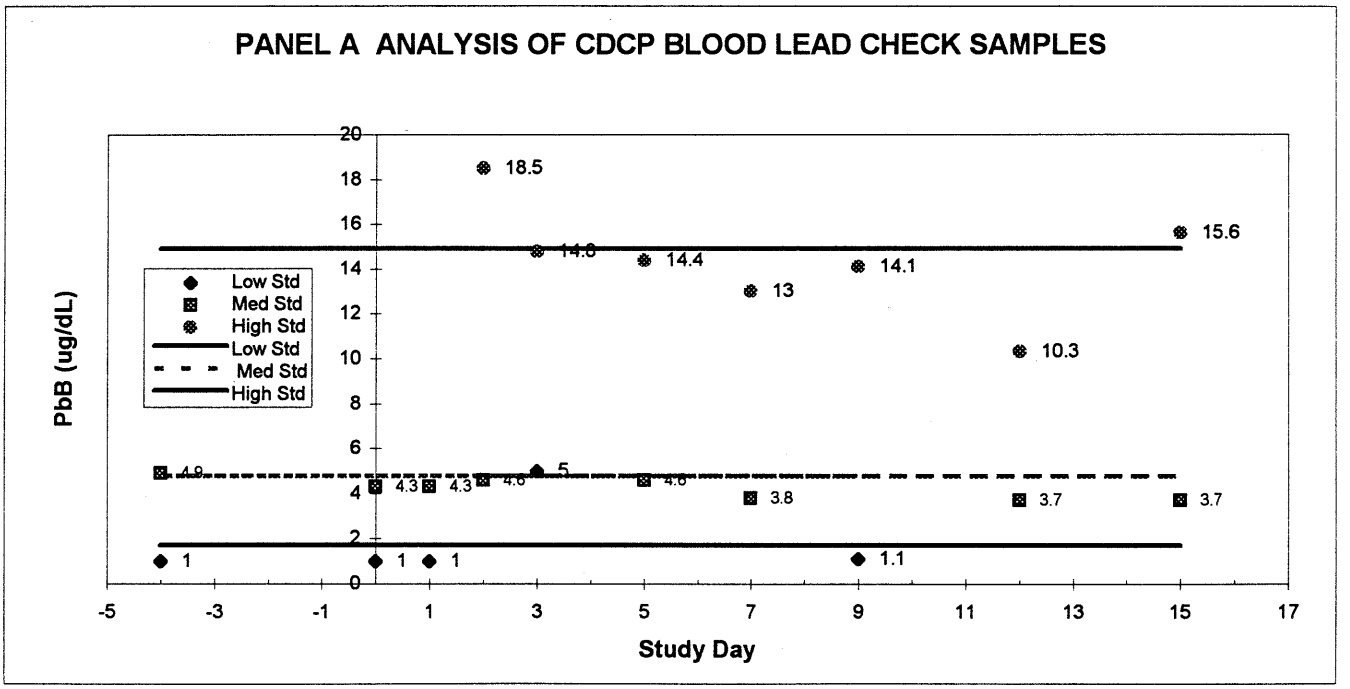
FIGURE A-5 COMPARISION OF DUPLICATE ANALYSES





Blind random duplicates submitted at a 5% rate to EPA laboratories to provide a measure of analytical precision (reproducibility)

FIGURE A-6 CDCP CHECK SAMPLES



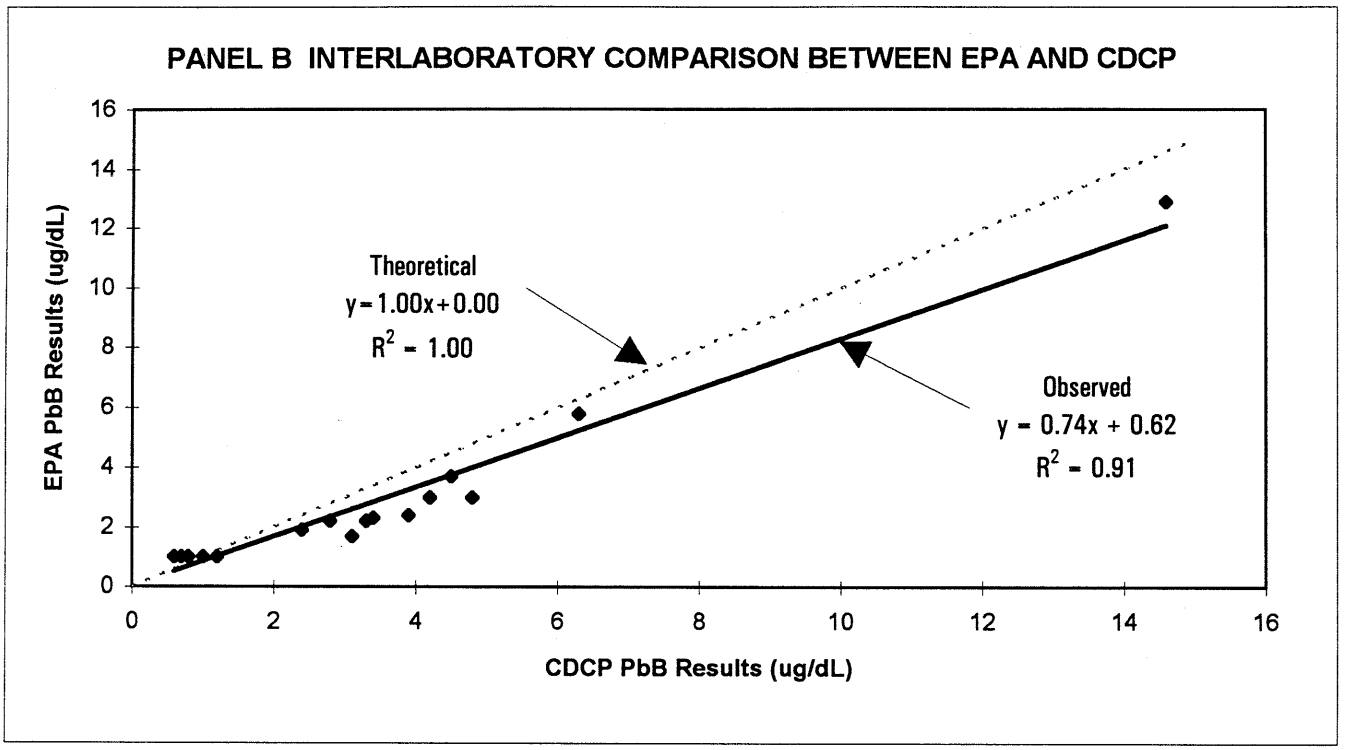
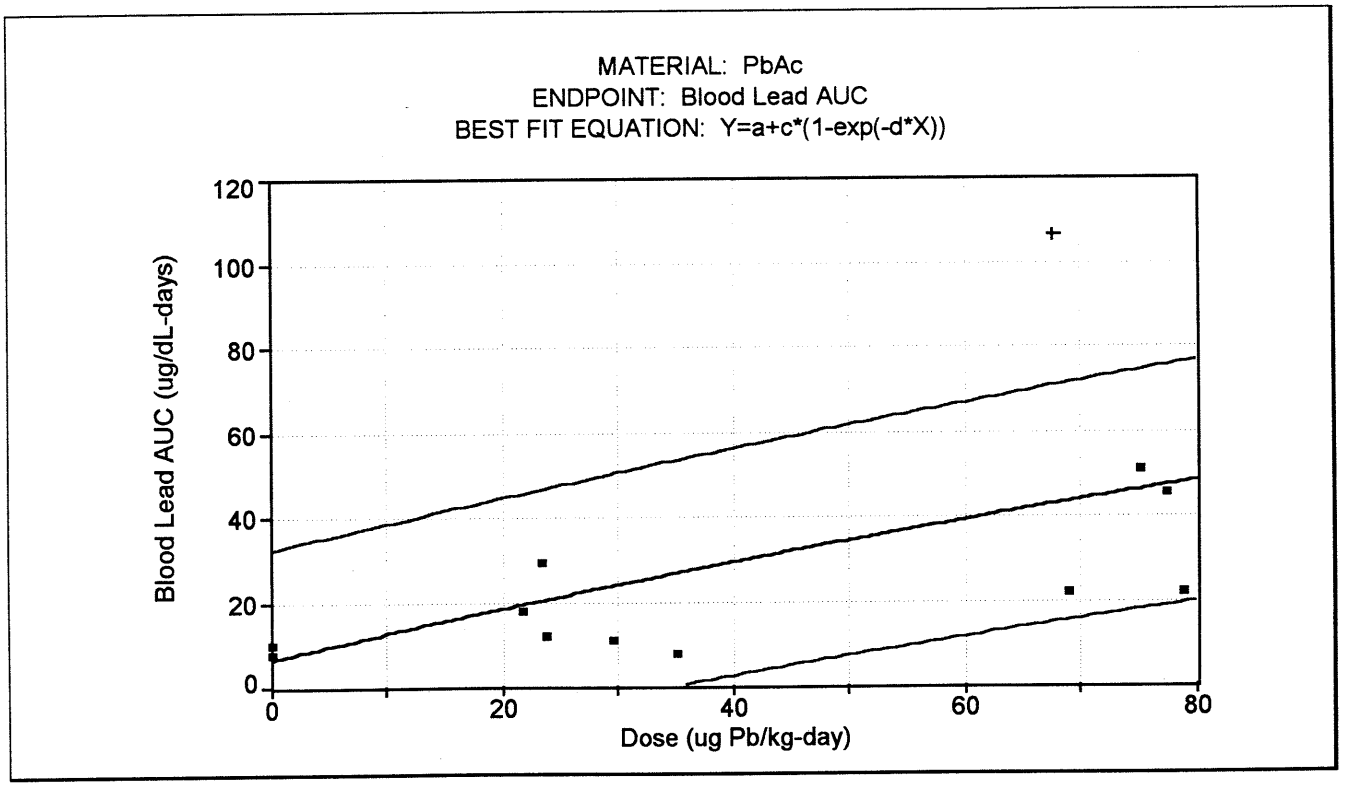


FIGURE A-7 BEST FIT CURVE WITH 95% PREDICTION INTERVALS*

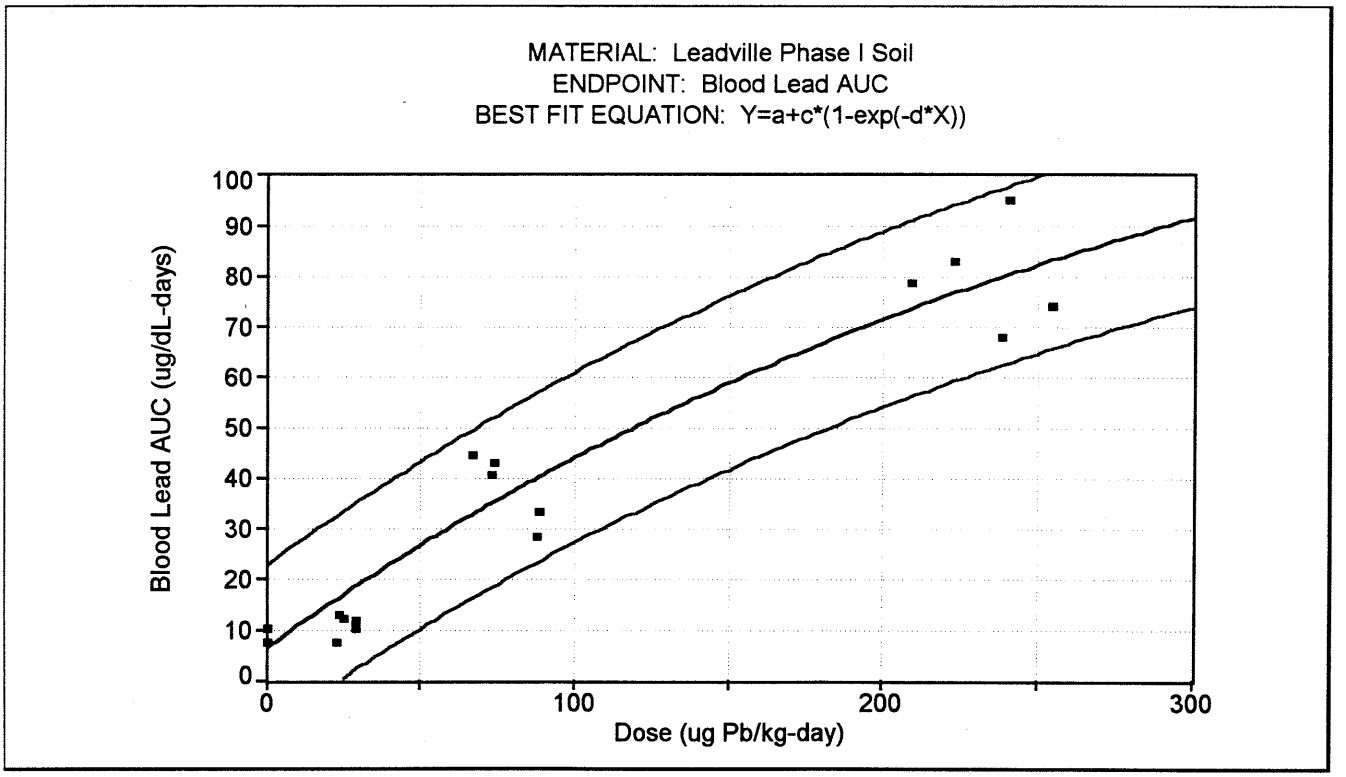


Parameters	Value	Std. Error	95% Confidence Limits	
a	6.2	fixed value	--	--
c	138.6	fixed value	--	--
d	0.0045	0.0007	0.0029	0.0061

Adj R^2	0.258

Generated using Table Curve 2D v. 3.0. Outliers represented by "+".

FIGURE A-8 BEST FIT CURVE WITH 95% PREDICTION INTERVALS*

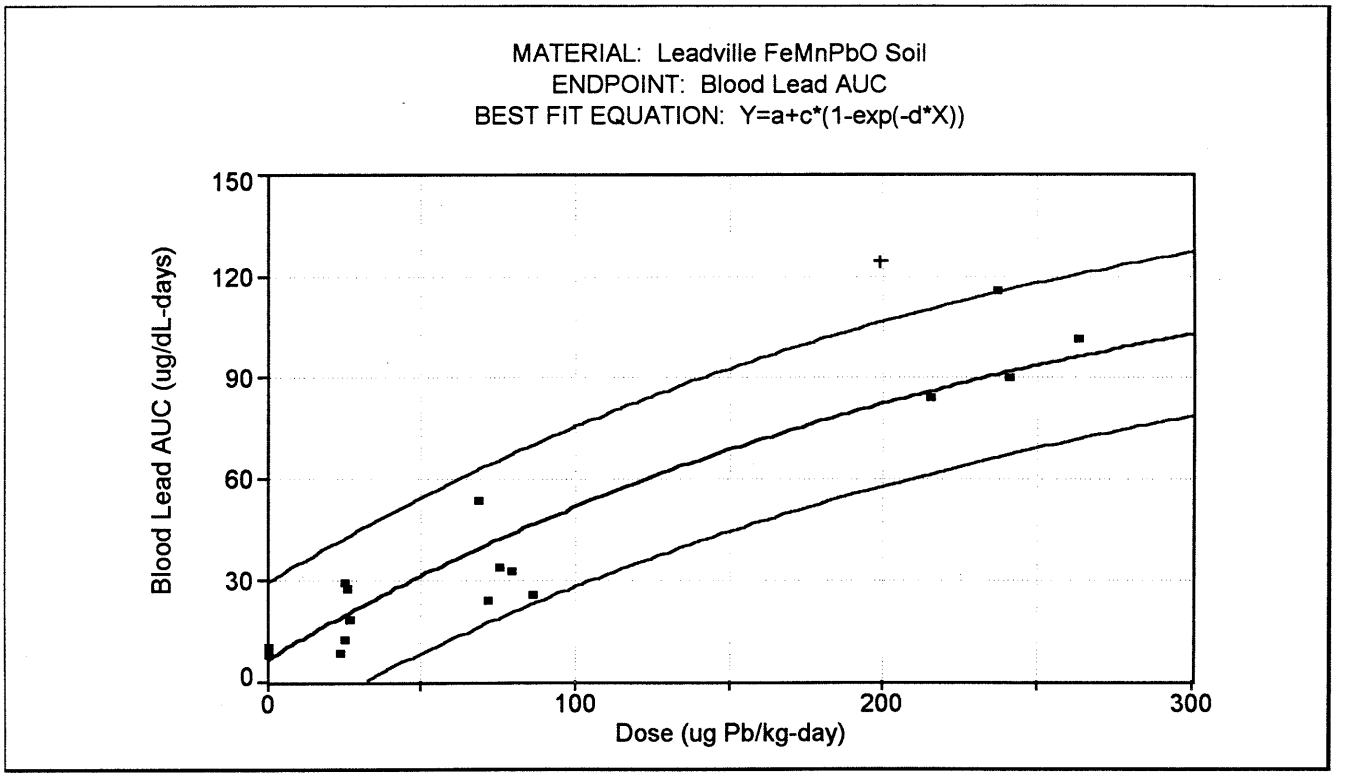


Parameters	Value	Std. Error	95% Confidence Limits	
a	6.2	fixed value	--	--
c	138.6	fixed value	--	--
d	0.0032	0.00019	0.0027	0.0036

Adj R^2	0.929

Generated using Table Curve 2D v. 3.0. Outliers represented by "+".

FIGURE A-9 BEST FIT CURVE WITH 95% PREDICTION INTERVALS*

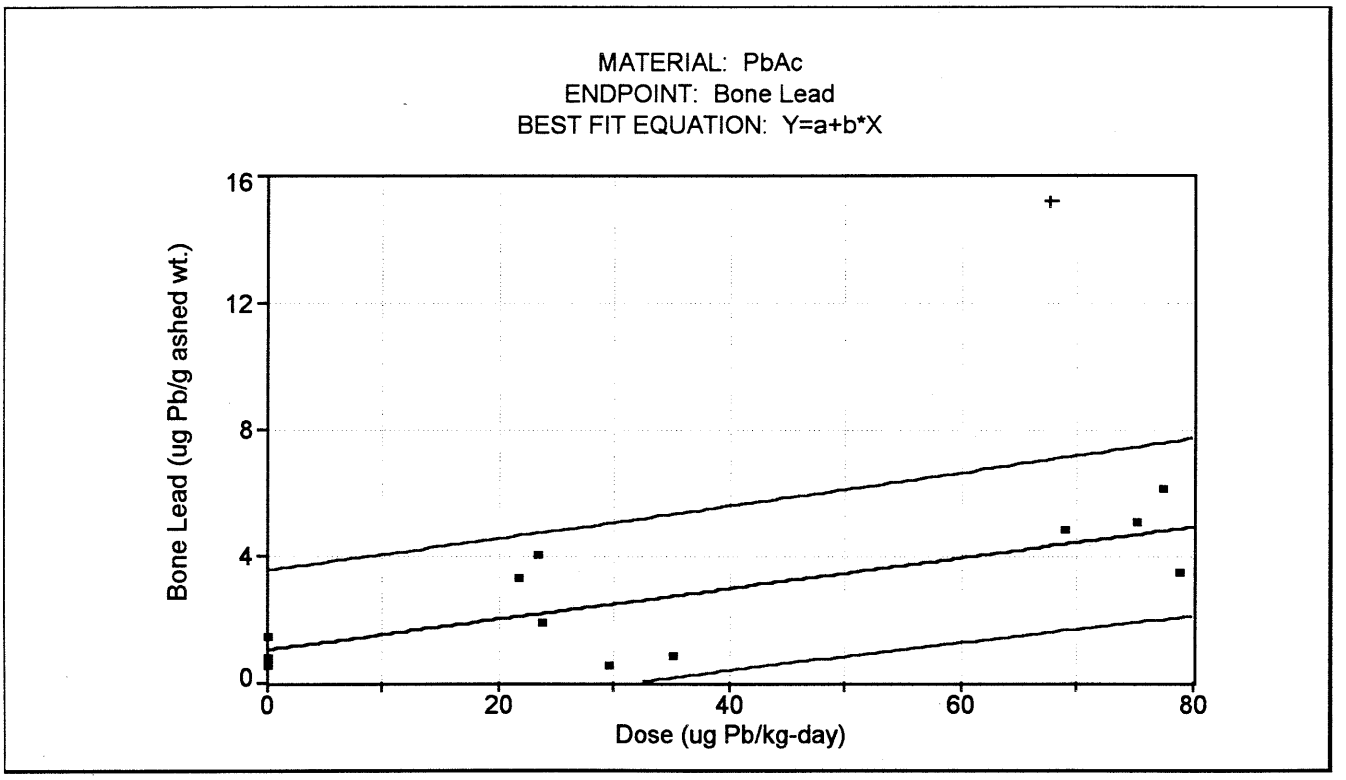


Parameters	Value	Std. Error	95% Confidence Limits	
a	6.2	fixed value	--	--
c	138.6	fixed value	--	--
d	0.0039	0.00033	0.0032	0.0046

Adj R^2	0.900

Generated using Table Curve 2D v. 3.0. Outliers represented by "+".

FIGURE A-10 BEST FIT CURVE WITH 95% PREDICTION INTERVALS*

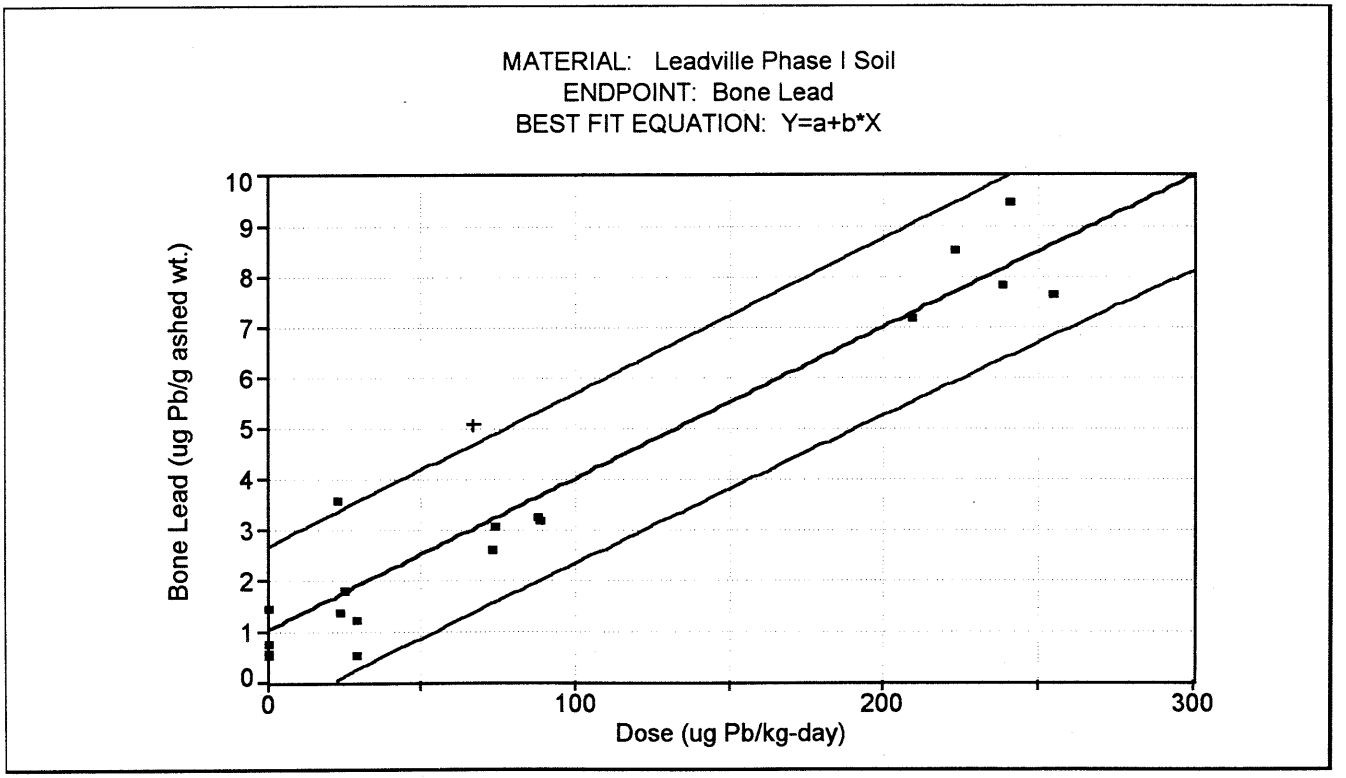


Parameters	Value	Std. Error	95% Confidence Limits	
a	1.0	fixed value	--	--
b	0.0484	0.007	0.033	0.064

Adj R^2	0.632

Generated using Table Curve 2D v. 3.0. Outliers represented by "+".

FIGURE A-11 BEST FIT CURVE WITH 95% PREDICTION INTERVALS*

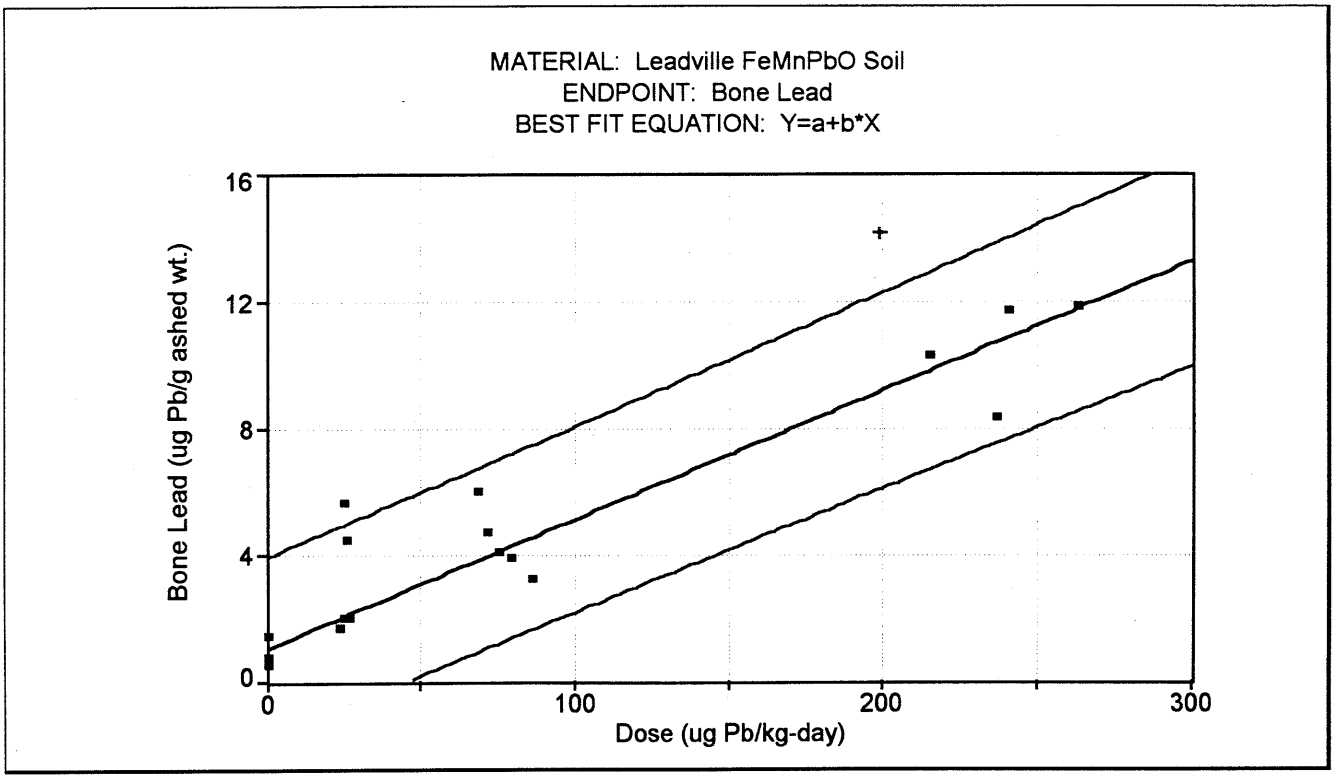


Parameters	Value	Std. Error	95% Confidence Limits	
a	1.0	fixed value	--	--
b	0.0298	0.0014	0.027	0.033

Adj R^2	0.932

Generated using Table Curve 2D v. 3.0. Outliers represented by "+".

FIGURE A-12 BEST FIT CURVE WITH 95% PREDICTION INTERVALS*

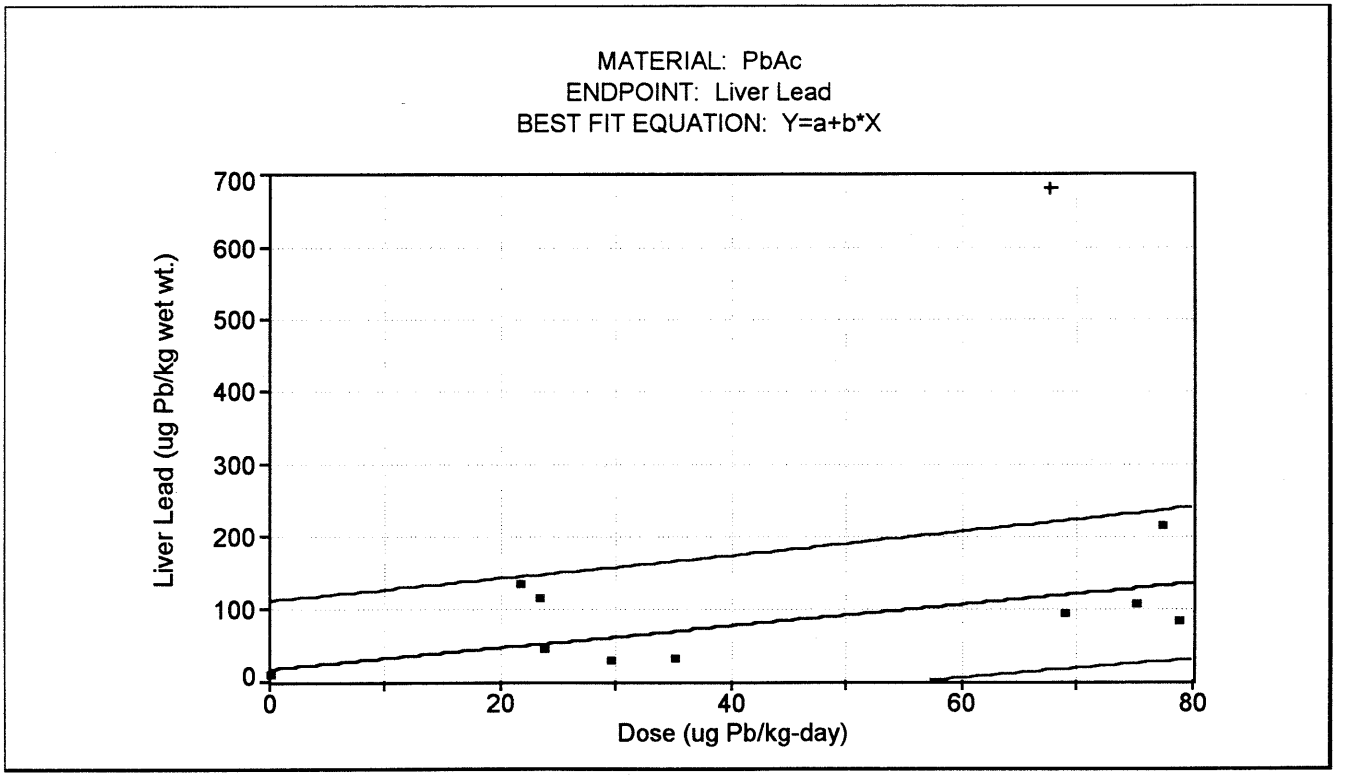


Parameters	Value	Std. Error	95% Confidence Limits	
a	1.0	fixed value	--	--
b	0.0407	0.0027	0.035	0.046

Adj R^2	0.858

Generated using Table Curve 2D v. 3.0. Outliers represented by "+".

FIGURE A-13 BEST FIT CURVE WITH 95% PREDICTION INTERVALS*

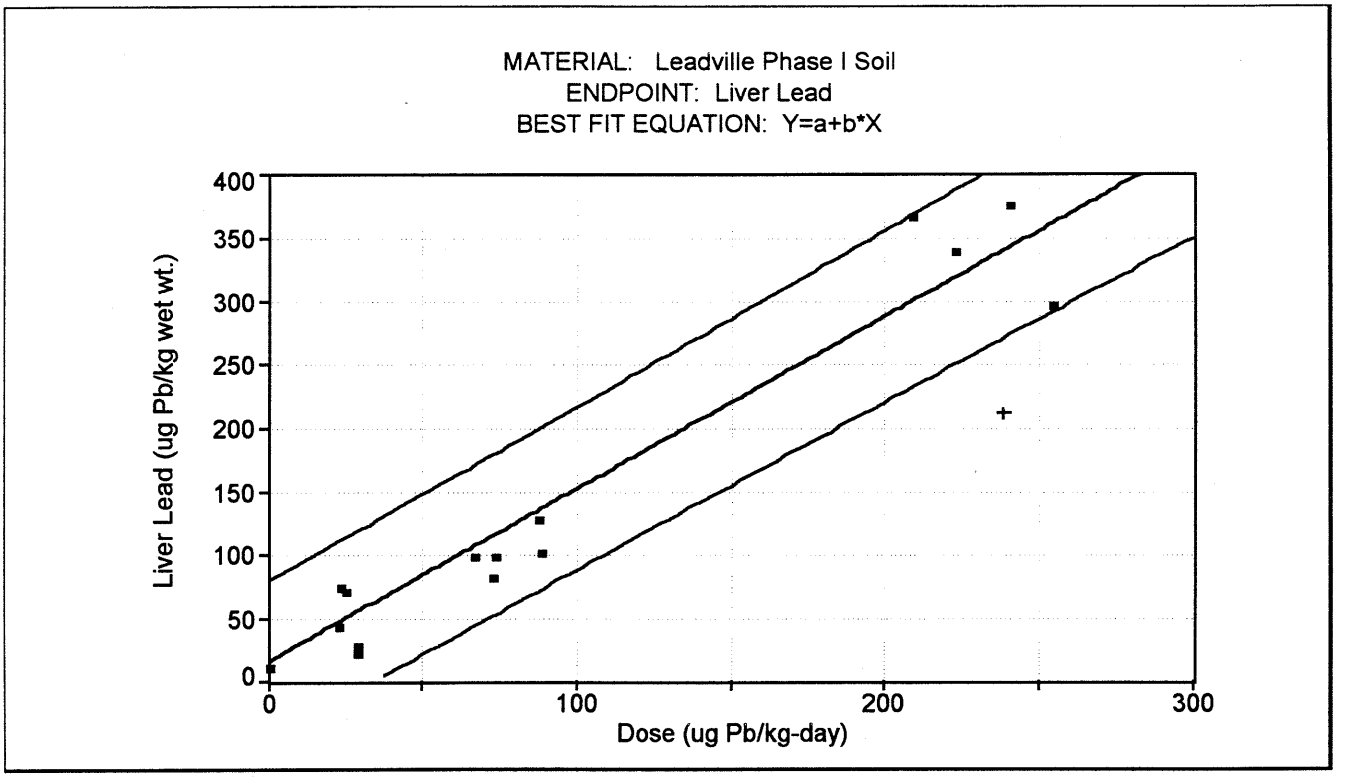


Parameters	Value	Std. Error	95% Confidence Limits	
a	15.3	fixed value	--	--
b	1.482	0.267	0.904	2.06

Adj R^2	0.465

Generated using Table Curve 2D v. 3.0. Outliers represented by "+".

FIGURE A-14 BEST FIT CURVE WITH 95% PREDICTION INTERVALS*

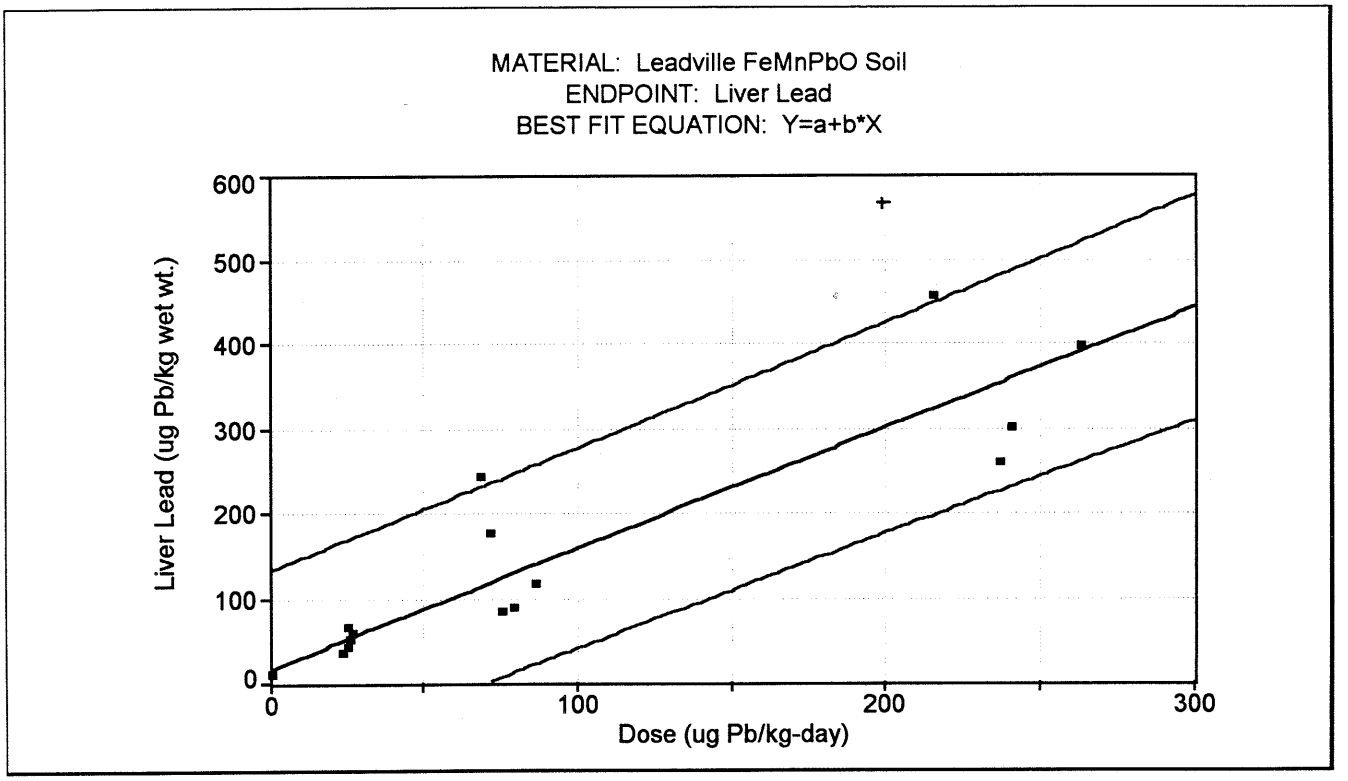


Parameters	Value	Std. Error	95% Confidence Limits	
a	15.3	fixed value	--	--
b	1.358	0.060	1.23	1.48

Adj R^2	0.942

Generated using Table Curve 2D v. 3.0. Outliers represented by "+".

FIGURE A-15 BEST FIT CURVE WITH 95% PREDICTION INTERVALS*

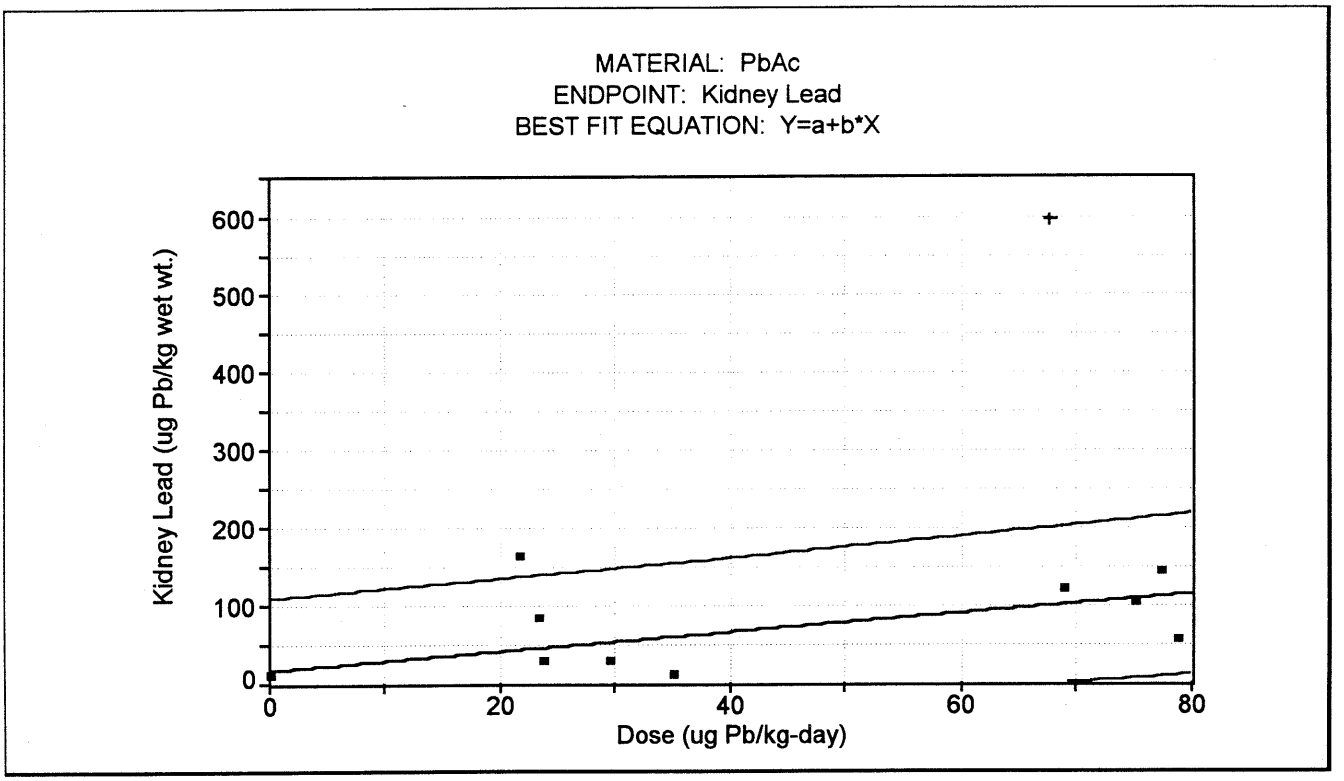


Parameters	Value	Std. Error	95% Confidence Limits	
a	15.3	fixed value	--	--
b	1.421	0.107	1.195	1.65

Adj R^2	0.833

Generated using Table Curve 2D v. 3.0. Outliers represented by "+".

FIGURE A-16 BEST FIT CURVE WITH 95% PREDICTION INTERVALS*

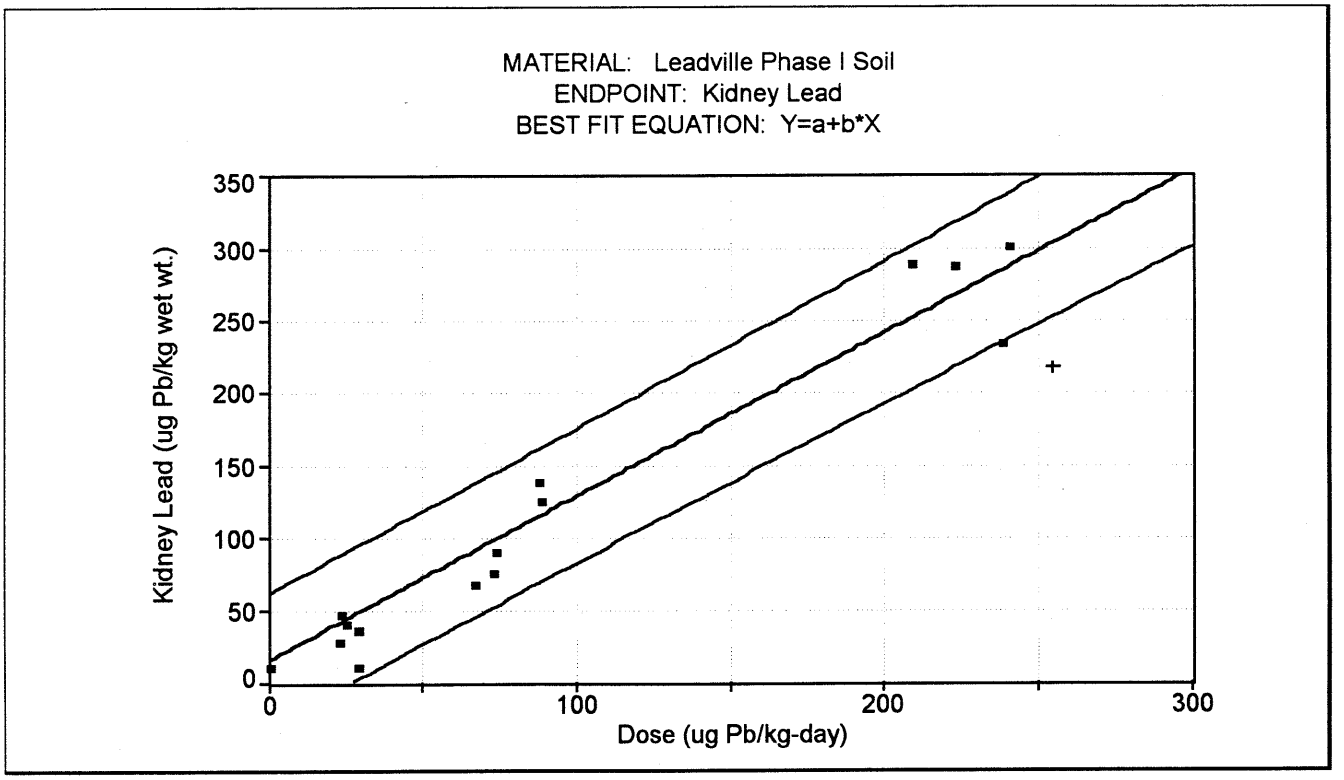


Parameters	Value	Std. Error	95% Confidence Limits	
a	15.1	fixed value	--	--
b	1.233	0.263	0.664	1.802

Adj R^2	0.359

Generated using Table Curve 2D v. 3.0. Outliers represented by "+".

FIGURE A-17 BEST FIT CURVE WITH 95% PREDICTION INTERVALS*

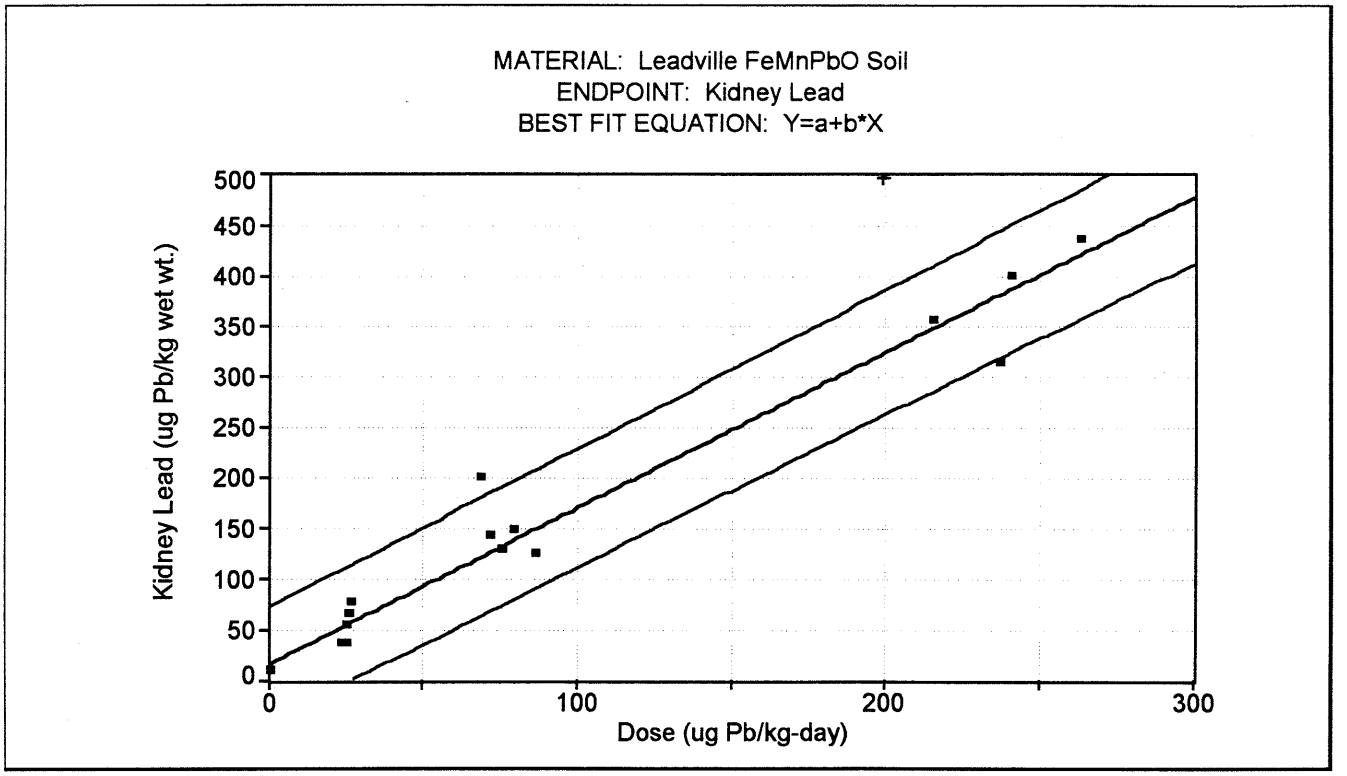


Parameters	Value	Std. Error	95% Confidence Limits	
a	15.1	fixed value	--	--
b	1.127	0.044	1.03	1.22

Adj R^2	0.954

Generated using Table Curve 2D v. 3.0. Outliers represented by "+".

FIGURE A-18 BEST FIT CURVE WITH 95% PREDICTION INTERVALS*



Parameters	Value	Std. Error	95% Confidence Limits	
a	15.1	fixed value	--	--
b	1.535	0.053	1.42	1.65

Adj R^2	0.961

Generated using Table Curve 2D v. 3.0. Outliers represented by "+".

SECTION B

STUDY 8

AV Slag

TABLE B-1 BODY WEIGHTS AND ADMINISTERED DOSES, BY DAY

Body weights were measured on days -1, 2, 5, 8, 11, 14. Weights for other days are estimated, based on linear interpolation between measured values.

Group	ID #	Day -1		Day 0		Day 1		Day 2		Day 3		Day 4		Day 5		Day 6		Day 7		Day 8		Day 9		Day 10		Day 11		Day 12		Day 13		Day 14		Day 15	
		BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day
5	809	8.54	0	8.8	0	9.1	0	9.32	0	9.8	0	10.2	0	10.7	0	11.1	0	11.5	0	11.9	0	12.4	0	12.9	0	13.36	0	13.9	0	14.4	0	14.9	0	15.4	0
5	830	8.98	0	8.8	0	8.6	0	8.46	0	8.8	0	9.2	0	9.62	0	9.6	0	9.6	0	9.62	0	10.2	0	10.8	0	11.32	0	11.7	0	12.2	0	12.6	0	13.0	0
5	841	8.24	0	8.4	0	8.6	0	8.78	0	9.3	0	9.9	0	10.44	0	10.8	0	11.1	0	11.48	0	11.8	0	12.1	0	12.38	0	13.1	0	13.7	0	14.4	0	15.1	0
5	848	10.14	0	10.6	0	11.1	0	11.54	0	11.9	0	12.4	0	12.76	0	13.2	0	13.7	0	14.12	0	14.5	0	14.9	0	15.26	0	15.8	0	16.3	0	16.8	0	17.3	0
5	855	9.36	0	9.8	0	10.2	0	10.6	0	10.5	0	10.5	0	10.44	0	10.9	0	11.3	0	11.72	0	12.4	0	13.0	0	13.64	0	14.2	0	14.7	0	15.2	0	15.7	0
6	817	8.72	0	9.2	242	9.6	242	10.04	242	10.5	263	10.9	263	11.4	263	12.0	291	12.5	291	13.06	291	13.5	322	13.9	322	14.26	322	14.6	348	15.0	348	15.3	348	15.6	0
6	818	9.92	0	10.3	242	10.7	242	11.06	242	11.3	263	11.6	263	11.88	263	12.1	291	12.4	291	12.68	291	12.5	322	12.4	322	12.28	322	12.8	348	13.2	348	13.7	348	14.2	0
6	819	7.64	0	7.9	242	8.1	242	8.28	242	8.6	263	8.8	263	9.12	263	9.6	291	10.1	291	10.62	291	10.9	322	11.2	322	11.54	322	12.1	348	12.7	348	13.3	348	13.9	0
6	838	9.26	0	9.4	242	9.6	242	9.7	242	10.1	263	10.5	263	10.96	263	11.3	291	11.6	291	11.96	291	12.6	322	13.3	322	13.92	322	14.1	348	14.4	348	14.6	348	14.8	0
6	846	7.82	0	8.1	242	8.3	242	8.54	242	9.0	263	9.4	263	9.8	263	10.2	291	10.7	291	11.12	291	11.6	322	12.0	322	12.5	322	13.0	348	13.4	348	13.9	348	14.4	0
7	804	8.24	0	8.4	732	8.5	732	8.6	732	8.8	801	9.1	801	9.34	801	9.7	878	10.1	878	10.42	878	10.8	966	11.1	966	11.5	966	11.9	1073	12.2	1073	12.6	1073	13.0	0
7	840	10.72	0	11.1	732	11.4	732	11.72	732	12.0	801	12.3	801	12.6	801	12.8	878	13.0	878	13.22	878	13.8	966	14.3	966	14.84	966	15.4	1073	15.9	1073	16.4	1073	16.9	0
7	842	8.5	0	8.8	732	9.1	732	9.34	732	9.8	801	10.3	801	10.72	801	11.2	878	11.7	878	12.12	878	12.6	966	13.2	966	13.7	966	14.4	1073	15.2	1073	15.9	1073	16.6	0
7	844	8.58	0	9.0	732	9.4	732	9.76	732	10.0	801	10.3	801	10.54	801	11.0	878	11.4	878	11.84	878	12.3	966	12.8	966	13.3	966	13.7	1073	14.2	1073	14.6	1073	15.0	0
7	849	7.78	0	8.2	732	8.6	732	8.96	732	9.4	801	9.9	801	10.36	801	10.8	878	11.3	878	11.8	878	12.3	966	12.7	966	13.18	966	13.7	1073	14.2	1073	14.7	1073	15.2	0
8	802	7.94	0	8.1	243	8.2	243	8.34	243	8.8	243	9.3	243	9.82	243	10.0	275	10.2	275	10.34	275	11.0	296	11.6	296	12.28	296	12.8	332	13.3	332	13.8	332	14.3	0
8	826	9.26	0	9.4	243	9.5	243	9.56	243	10.2	243	10.7	243	11.34	243	11.5	275	11.7	275	11.84	275	12.4	296	12.9	296	13.42	296	13.9	332	14.3	332	14.8	332	15.3	0
8	828	10.64	0	10.6	243	10.5	243	10.4	243	10.6	243	10.8	243	11.02	243	11.4	275	11.8	275	12.16	275	12.6	296	13.1	296	13.52	296	14.0	332	14.5	332	15	332	15.5	0
8	831	7.58	0	7.4	243	7.2	243	7	243	7.3	243	7.6	243	7.86	243	8.3	275	8.7	275	9.12	275	9.5	296	9.9	296	10.36	296	10.8	332	11.3	332	11.8	332	12.3	0
8	851	8.26	0	8.3	243	8.3	243	8.36	243	8.9	243	9.4	243	9.92	243	10.2	275	10.4	275	10.65	275	11.0	296	11.4	296	11.8	296	12.2	332	12.6	332	13	332	13.4	0
9	806	8.8	0	9.2	755	9.5	755	9.88	755	10.2	835	10.5	835	10.84	835	11.2	916	11.7	916	12.06	916	12.5	1022	12.8	1022	13.24	1022	13.7	1118	14.1	1118	14.6	1118	15.1	0
9	814	9.6	0	9.9	755	10.3	755	10.64	755	11.1	835	11.5	835	11.92	835	12.4	916	12.9	916	13.34	916	13.9	1022	14.5	1022	15.14	1022	15.7	1118	16.2	1118	16.7	1118	17.2	0
9	823	8.54	0	8.8	755	9.1	755	9.36	755	9.8	835	10.2	835	10.58	835	11.1	916	11.6	916	12.16	916	12.7	1022	13.2	1022	13.66	1022	14.0	1118	14.3	1118	14.6	1118	14.9	0
9	847	9.24	0	9.6	755	10.0	755	10.44	755	10.8	835	11.1	835	11.42	835	11.8	916	12.2	916	12.56	916	12.8	1022	13.0	1022	13.28	1022	13.9	1118	14.6	1118	15.2	1118	15.8	0
9	854	9.12	0	9.5	755	9.9	755	10.34	755	10.7	835	11.0	835	11.28	835	11.8	916	12.4	916	12.98	916	13.4	1022	13.8	1022	14.2	1022	14.9	1118	15.5	1118	16.2	1118	16.9	0
10	811	8.42	0	8.8	2089	9.1	2089	9.48	2089	9.9	2262	10.3	2262	10.68	2262	10.9	2473	11.1	2473	11.36	2473	11.6	2675	11.9	2675	12.18	2675	13.0	2935	13.7	2935	14.5	2935	15.3	0
10	822	9.24	0	9.5	2089	9.7	2089	10	2089	10.4	2262	10.8	2262	11.16	2262	11.7	2473	12.2	2473	12.78	2473	13.1	2675	13.4	2675	13.76	2675	14.4	2935	15.1	2935	15.8	2935	16.5	0
10	824	7.68	0	8.2	2089	8.6	2089	9.12	2089	9.5	2262	9.9	2262	10.36	2262	10.6	2473	10.8	2473	11.04	2473	11.5	2675	12.1	2675	12.56	2675	13.1	2935	13.7	2935	14.3	2935	14.9	0
10	837	8.72	0	8.7	2089	8.6	2089	8.54	2089	8.6	2262	8.6	2262	8.64	2262	8.8	2473	8.9	2473	8.98	2473	9.2	2675	9.4	2675	9.68	2675	10.2	2935	10.7	2935	11.2	2935	11.7	0
10	856	7.36	0	7.6	2089	7.9	2089	8.12	2089	8.5	2262	8.8	2262	9.12	2262	9.5	2473	9.9	2473	10.28	2473	10.9	2675	11.5	2675	12.04	2675	12.5	2935	12.9	2935	13.3	2935	13.7	0

Shaded boxes show days in which adminstered doses were ingested late

TABLE B-2
Body Weight Adjusted Doses
(Dose for Day/BW for Day)

Group	ID #	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11	Day 12	Day 13	Day 14	Avg Dose	Target Dose	% Target	Avg %
5	809	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0		
5	830	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0		
5	841	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0		
5	848	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0		
5	855	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0		
6	817	26.4	25.2	24.1	25.1	24.0	23.1	24.3	23.3	22.3	23.9	23.2	22.6	23.8	23.2	22.7	23.8	25	95	
6	818	23.5	22.6	21.9	23.2	22.7	22.1	23.9	23.4	22.9	25.7	26.0	26.2	27.2	26.3	25.4	24.2	25	97	
6	819	30.8	30.0	29.2	30.7	29.8	28.8	30.2	28.7	27.4	29.5	28.7	27.9	28.7	27.3	26.1	28.9	25	116	
6	838	25.7	25.3	24.9	26.0	25.0	24.0	25.7	25.0	24.3	25.5	24.3	23.1	24.6	24.2	23.8	24.8	25	99	
6	846	30.0	29.1	28.3	29.4	28.0	26.8	28.4	27.2	26.2	27.8	26.8	25.8	26.8	25.9	25.0	27.4	25	110	103
7	804	87.6	86.4	85.2	90.5	88.1	85.7	90.6	87.3	84.3	89.6	86.7	84.0	90.4	87.7	85.1	87.3	75	116	
7	840	66.3	64.3	62.5	66.7	65.1	63.5	68.6	67.5	66.4	70.2	67.6	65.1	69.8	67.6	65.4	66.4	75	89	
7	842	83.4	80.8	78.4	81.7	78.0	74.7	78.5	75.4	72.5	76.4	73.3	70.5	74.3	70.7	67.5	75.7	75	101	
7	844	81.6	78.2	75.0	79.9	77.9	76.0	80.0	77.0	74.2	78.4	75.4	72.6	78.1	75.7	73.5	76.9	75	103	
7	849	89.6	85.5	81.7	84.9	80.9	77.3	81.0	77.6	74.4	78.8	75.9	73.3	78.4	75.6	73.0	79.2	75	106	103
8	802	30.1	29.7	29.2	27.5	26.1	24.8	27.5	27.0	26.6	26.9	25.4	24.1	26.0	25.0	24.1	26.7	25	107	
8	826	26.0	25.7	25.5	24.0	22.6	21.5	23.9	23.5	23.2	23.9	22.9	22.0	23.9	23.1	22.4	23.6	25	94	
8	828	23.0	23.2	23.4	22.9	22.5	22.1	24.1	23.3	22.6	23.4	22.6	21.9	23.7	22.9	22.1	22.9	25	92	
8	831	33.0	33.8	34.8	33.4	32.1	31.0	33.2	31.6	30.1	31.0	29.7	28.5	30.6	29.3	28.1	31.3	25	125	
8	851	29.3	29.2	29.1	27.4	25.9	24.5	27.0	26.4	25.8	26.8	25.9	25.0	27.2	26.3	25.5	26.8	25	107	105
9	806	82.4	79.3	76.4	81.9	79.4	77.0	81.4	78.6	75.9	82.0	79.5	77.2	81.6	79.0	76.6	79.2	75	106	
9	814	75.9	73.3	70.9	75.4	72.6	70.0	73.9	71.2	68.6	73.3	70.3	67.5	71.4	69.1	66.9	71.4	75	95	
9	823	85.6	83.0	80.6	85.5	82.1	78.9	82.4	78.7	75.3	80.7	77.6	74.8	80.0	78.2	76.6	80.0	75	107	
9	847	78.3	75.1	72.3	77.5	75.3	73.1	77.6	75.2	72.9	79.8	78.3	76.9	80.3	76.8	73.5	76.2	75	102	
9	854	79.2	76.0	73.0	78.4	76.1	74.0	77.3	73.8	70.5	76.3	74.1	71.9	75.2	72.0	69.0	74.4	75	99	102
10	811	238.1	228.9	220.3	228.9	220.0	211.8	226.8	222.1	217.7	229.9	224.6	219.6	226.6	213.8	202.4	222.1	225	99	
10	822	220.0	214.3	208.9	217.8	209.9	202.7	211.4	202.1	193.5	204.1	199.1	194.4	203.2	194.1	185.8	204.1	225	91	
10	824	256.0	241.8	229.0	237.2	227.4	218.3	233.6	228.7	224.0	231.7	221.9	213.0	223.4	213.9	205.2	227.0	225	101	
10	837	241.2	242.9	244.6	263.8	262.8	261.8	282.5	278.9	275.4	290.3	283.1	276.3	288.1	274.5	262.0	268.6	225	119	
10	856	274.4	265.5	257.3	267.6	257.4	248.0	260.2	250.0	240.6	246.1	233.5	222.2	235.5	227.9	220.7	247.1	225	110	104

TABLE B - 3 RAW AND ADJUSTED BLOOD LEAD DATA

pig number	sample	group	material administered	dosage	qualifier	Lab result (ug/L)	day	source file	MATRIX	Adjusted Value[a]	Notes
809	8-980121	5	Control	0	<	1	-4	T951101	BLOOD	0.5	
830	8-980170	5	Control	0	<	1	-4	T951101	BLOOD	0.5	
841	8-980171	5	Control	0	<	1	-4	T951101	BLOOD	0.5	
848	8-980169	5	Control	0	<	1	-4	T951101	BLOOD	0.5	
855	8-980120	5	Control	0	<	1	-4	T951101	BLOOD	0.5	
817	8-980154	6	PbAc	25	<	1	-4	T951101	BLOOD	0.5	
818	8-980162	6	PbAc	25	<	1	-4	T951101	BLOOD	0.5	
819	8-980157	6	PbAc	25	<	1	-4	T951101	BLOOD	0.5	
838	8-980122	6	PbAc	25	<	1	-4	T951101	BLOOD	0.5	
846	8-980124	6	PbAc	25	<	1	-4	T951101	BLOOD	0.5	
804	8-980156	7	PbAc	75	<	1	-4	T951101	BLOOD	0.5	
840	8-980167	7	PbAc	75	<	1	-4	T951101	BLOOD	0.5	
842	8-980129	7	PbAc	75	<	1	-4	T951101	BLOOD	0.5	
844	8-980158	7	PbAc	75	<	1	-4	T951101	BLOOD	0.5	
849	8-980138	7	PbAc	75	<	1	-4	T951101	BLOOD	0.5	
802	8-980150	8	AV Slag	25			-4		BLOOD		Clotted
826	8-980139	8	AV Slag	25	<	1	-4	T951101	BLOOD	0.5	
828	8-980147	8	AV Slag	25	<	1	-4	T951101	BLOOD	0.5	
831	8-980131	8	AV Slag	25	<	1	-4	T951101	BLOOD	0.5	
851	8-980166	8	AV Slag	25	<	1	-4	T951101	BLOOD	0.5	
806	8-980132	9	AV Slag	75	<	1	-4	T951101	BLOOD	0.5	
814	8-980152	9	AV Slag	75	<	1	-4	T951101	BLOOD	0.5	
823	8-980143	9	AV Slag	75	<	1	-4	T951101	BLOOD	0.5	
847	8-980153	9	AV Slag	75	<	1	-4	T951101	BLOOD	0.5	
854	8-980148	9	AV Slag	75	<	1	-4	T951101	BLOOD	0.5	
811	8-980130	10	AV Slag	225	<	1	-4	T951101	BLOOD	0.5	
822	8-980133	10	AV Slag	225	<	1	-4	T951101	BLOOD	0.5	
824	8-980136	10	AV Slag	225	<	1	-4	T951101	BLOOD	0.5	
837	8-980141	10	AV Slag	225	<	1	-4	T951101	BLOOD	0.5	
856	8-980159	10	AV Slag	225	<	1	-4	T951101	BLOOD	0.5	
809	8-980213	5	Control	0	<	1	0	T951101	BLOOD	0.5	
830	8-980210	5	Control	0	<	1	0	T951101	BLOOD	0.5	
841	8-980197	5	Control	0	<	1	0	T951101	BLOOD	0.5	
848	8-980200	5	Control	0	<	1	0	T951101	BLOOD	0.5	
855	8-980209	5	Control	0	<	1	0	T951101	BLOOD	0.5	
817	8-980192	6	PbAc	25	<	1	0	T951101	BLOOD	0.5	
818	8-980176	6	PbAc	25	<	1	0	T951101	BLOOD	0.5	
819	8-980222	6	PbAc	25	<	1	0	T951101	BLOOD	0.5	
838	8-980220	6	PbAc	25	<	1	0	T951101	BLOOD	0.5	
846	8-980204	6	PbAc	25	<	1	0	T951101	BLOOD	0.5	
804	8-980198	7	PbAc	75	<	1	0	T951101	BLOOD	0.5	
840	8-980185	7	PbAc	75	<	1	0	T951101	BLOOD	0.5	
842	8-980187	7	PbAc	75	<	1	0	T951101	BLOOD	0.5	
844	8-980212	7	PbAc	75	<	1	0	T951101	BLOOD	0.5	
849	8-980177	7	PbAc	75	<	1	0	T951101	BLOOD	0.5	
802	8-980223	8	AV Slag	25	<	1	0	T951101	BLOOD	0.5	
826	8-980203	8	AV Slag	25	<	1	0	T951101	BLOOD	0.5	
828	8-980225	8	AV Slag	25	<	1	0	T951101	BLOOD	0.5	
831	8-980179	8	AV Slag	25	<	1	0	T951101	BLOOD	0.5	
851	8-980199	8	AV Slag	25	<	1	0	T951101	BLOOD	0.5	
806	8-980202	9	AV Slag	75	<	1	0	T951101	BLOOD	0.5	
814	8-980183	9	AV Slag	75	<	1	0	T951101	BLOOD	0.5	
823	8-980194	9	AV Slag	75	<	1	0	T951101	BLOOD	0.5	
847	8-980193	9	AV Slag	75	<	1	0	T951101	BLOOD	0.5	
854	8-980211	9	AV Slag	75	<	1	0	T951101	BLOOD	0.5	
811	8-980219	10	AV Slag	225	<	1	0	T951101	BLOOD	0.5	
822	8-980221	10	AV Slag	225	<	1	0	T951101	BLOOD	0.5	
824	8-980174	10	AV Slag	225	<	1	0	T951101	BLOOD	0.5	
837	8-980178	10	AV Slag	225	<	1	0	T951101	BLOOD	0.5	
856	8-980180	10	AV Slag	225	<	1	0	T951101	BLOOD	0.5	
809	8-980227	5	Control	0	<	1	1	T951101	BLOOD	0.5	
830	8-980276	5	Control	0	<	1	1	T951101	BLOOD	0.5	
841	8-980270	5	Control	0	<	1	1	T951101	BLOOD	0.5	
848	8-980272	5	Control	0	<	1	1	T951101	BLOOD	0.5	
855	8-980260	5	Control	0	<	1	1	T951101	BLOOD	0.5	
817	8-980239	6	PbAc	25	<	1	1	T951101	BLOOD	0.5	
818	8-980274	6	PbAc	25	<	1	1	T951101	BLOOD	0.5	
819	8-980258	6	PbAc	25	<	1	1	T951101	BLOOD	0.5	
838	8-980254	6	PbAc	25	<	1	1	T951101	BLOOD	0.5	
846	8-980244	6	PbAc	25	<	1	1	T951101	BLOOD	0.5	
804	8-980252	7	PbAc	75	<	1	1	T951101	BLOOD	0.5	
840	8-980251	7	PbAc	75		1.7	1	T951101	BLOOD	1.7	
842	8-980234	7	PbAc	75		1.3	1	T951101	BLOOD	1.3	
844	8-980256	7	PbAc	75		1.8	1	T951101	BLOOD	1.8	
849	8-980267	7	PbAc	75		1.1	1	T951101	BLOOD	1.1	
802	8-980240	8	AV Slag	25	<	1	1	T951101	BLOOD	0.5	
826	8-980266	8	AV Slag	25		1.2	1	T951101	BLOOD	1.2	
828	8-980261	8	AV Slag	25	<	1	1	T951101	BLOOD	0.5	
831	8-980263	8	AV Slag	25	<	1	1	T951101	BLOOD	0.5	
851	8-980257	8	AV Slag	25	<	1	1	T951101	BLOOD	0.5	
806	8-980237	9	AV Slag	75	<	1	1	T951101	BLOOD	0.5	
814	8-980226	9	AV Slag	75		1.5	1	T951101	BLOOD	1.5	
823	8-980233	9	AV Slag	75		1.1	1	T951101	BLOOD	1.1	
847	8-980241	9	AV Slag	75	<	1	1	T951101	BLOOD	0.5	
854	8-980271	9	AV Slag	75	<	1	1	T951101	BLOOD	0.5	
811	8-980255	10	AV Slag	225	<	1	1	T951101	BLOOD	0.5	
822	8-980273	10	AV Slag	225	<	1	1	T951101	BLOOD	0.5	
824	8-980245	10	AV Slag	225	<	1	1	T951101	BLOOD	0.5	

pig number	sample	group	material administered	dosage	qualifier	(ug/L)	day	source file	MATRIX	Adjusted Value[a]	Notes
837	8-980236	10	AV Slag	225	<	1	1	T951101	BLOOD	0.5	
856	8-980262	10	AV Slag	225	<	1	1	T951101	BLOOD	0.5	
809	8-980310	5	Control	0	<	1	2	T951101	BLOOD	0.5	
830	8-980289	5	Control	0	<	1	2	T951101	BLOOD	0.5	
841	8-980330	5	Control	0	<	1	2	T951108	BLOOD	0.5	
848	8-980281	5	Control	0	<	1	2	T951101	BLOOD	0.5	
855	8-980323	5	Control	0	<	1	2	T951101	BLOOD	0.5	
817	8-980316	6	PbAc	25		1.8	2	T951101	BLOOD	1.8	
818	8-980299	6	PbAc	25	<	1	2	T951101	BLOOD	0.5	
819	8-980322	6	PbAc	25	<	1	2	T951101	BLOOD	0.5	
838	8-980280	6	PbAc	25	<	1	2	T951101	BLOOD	0.5	
846	8-980331	6	PbAc	25		1.9	2	T951108	BLOOD	1.9	
804	8-980320	7	PbAc	75	<	1	2	T951101	BLOOD	0.5	
840	8-980290	7	PbAc	75		1.7	2	T951101	BLOOD	1.7	
842	8-980297	7	PbAc	75		1.5	2	T951101	BLOOD	1.5	
844	8-980294	7	PbAc	75		1.8	2	T951101	BLOOD	1.8	
849	8-980313	7	PbAc	75	<	1	2	T951101	BLOOD	0.5	
802	8-980312	8	AV Slag	25	<	1	2	T951101	BLOOD	0.5	
826	8-980325	8	AV Slag	25	<	1	2	T951101	BLOOD	0.5	
828	8-980317	8	AV Slag	25	<	1	2	T951101	BLOOD	0.5	
831	8-980305	8	AV Slag	25	<	1	2	T951101	BLOOD	0.5	
851	8-980285	8	AV Slag	25	<	1	2	T951101	BLOOD	0.5	
806	8-980321	9	AV Slag	75	<	1	2	T951101	BLOOD	0.5	
814	8-980315	9	AV Slag	75	<	1	2	T951101	BLOOD	0.5	
823	8-980296	9	AV Slag	75	<	1	2	T951101	BLOOD	0.5	
847	8-980328	9	AV Slag	75	<	1	2	T951101	BLOOD	0.5	
854	8-980286	9	AV Slag	75		1	2	T951101	BLOOD	1	
811	8-980318	10	AV Slag	225	<	1	2	T951101	BLOOD	0.5	
822	8-980319	10	AV Slag	225		1	2	T951101	BLOOD	1	
824	8-980293	10	AV Slag	225		1	2	T951101	BLOOD	1	
837	8-980284	10	AV Slag	225		1.4	2	T951101	BLOOD	1.4	
856	8-980283	10	AV Slag	225	<	1	2	T951101	BLOOD	0.5	
809	8-980342	5	Control	0	<	1	3	T951108	BLOOD	0.5	
830	8-980355	5	Control	0	<	1	3	T951108	BLOOD	0.5	
841	8-980357	5	Control	0	<	1	3	T951108	BLOOD	0.5	
848	8-980333	5	Control	0	<	1	3	T951108	BLOOD	0.5	
855	8-980361	5	Control	0	<	1	3	T951108	BLOOD	0.5	
817	8-980370	6	PbAc	25		2.9	3	T951108	BLOOD	2.9	
818	8-980352	6	PbAc	25	<	1	3	T951108	BLOOD	0.5	
819	8-980382	6	PbAc	25	<	1	3	T951108	BLOOD	0.5	
838	8-980337	6	PbAc	25		1.7	3	T951108	BLOOD	1.7	
846	8-980356	6	PbAc	25	<	1	3	T951108	BLOOD	0.5	
804	8-980372	7	PbAc	75	<	1	3	T951108	BLOOD	0.5	
840	8-980345	7	PbAc	75		2.4	3	T951108	BLOOD	2.4	
842	8-980373	7	PbAc	75		1.7	3	T951108	BLOOD	1.7	
844	8-980383	7	PbAc	75		1.9	3	T951108	BLOOD	1.9	
849	8-980359	7	PbAc	75		1	3	T951108	BLOOD	1	
802	8-980358	8	AV Slag	25	<	1	3	T951108	BLOOD	0.5	
826	8-980349	8	AV Slag	25	<	1	3	T951108	BLOOD	0.5	
828	8-980380	8	AV Slag	25	<	1	3	T951108	BLOOD	0.5	
831	8-980350	8	AV Slag	25	<	1	3	T951108	BLOOD	0.5	
851	8-980367	8	AV Slag	25	<	1	3	T951108	BLOOD	0.5	
806	8-980354	9	AV Slag	75	<	1	3	T951108	BLOOD	0.5	
814	8-980379	9	AV Slag	75		1.3	3	T951108	BLOOD	1.3	
823	8-980343	9	AV Slag	75		1.5	3	T951108	BLOOD	1.5	
847	8-980360	9	AV Slag	75		1.5	3	T951108	BLOOD	1.5	
854	8-980364	9	AV Slag	75		1	3	T951108	BLOOD	1	
811	8-980340	10	AV Slag	225		2.8	3	T951108	BLOOD	2.8	
822	8-980353	10	AV Slag	225		2	3	T951108	BLOOD	2	
824	8-980365	10	AV Slag	225		1.6	3	T951108	BLOOD	1.6	
837	8-980377	10	AV Slag	225		1.7	3	T951108	BLOOD	1.7	
856	8-980336	10	AV Slag	225		1.7	3	T951108	BLOOD	1.7	
809	8-980434	5	Control	0	<	1	5	T951108	BLOOD	0.5	
830	8-980401	5	Control	0	<	1	5	T951108	BLOOD	0.5	
841	8-980393	5	Control	0	<	1	5	T951108	BLOOD	0.5	
848	8-980405	5	Control	0	<	1	5	T951108	BLOOD	0.5	
855	8-980406	5	Control	0	<	1	5	T951108	BLOOD	0.5	
817	8-980389	6	PbAc	25		1.7	5	T951108	BLOOD	1.7	
818	8-980416	6	PbAc	25		1	5	T951108	BLOOD	1	
819	8-980394	6	PbAc	25		3	5	T951108	BLOOD	3	
838	8-980422	6	PbAc	25		1.3	5	T951108	BLOOD	1.3	
846	8-980427	6	PbAc	25	<	1	5	T951108	BLOOD	0.5	
804	8-980410	7	PbAc	75		2.8	5	T951108	BLOOD	2.8	
840	8-980428	7	PbAc	75		3.2	5	T951108	BLOOD	3.2	
842	8-980413	7	PbAc	75		2.7	5	T951108	BLOOD	2.7	
844	8-980425	7	PbAc	75		2.1	5	T951108	BLOOD	2.1	
849	8-980433	7	PbAc	75		1	5	T951108	BLOOD	1	
802	8-980390	8	AV Slag	25	<	1	5	T951108	BLOOD	0.5	
826	8-980407	8	AV Slag	25		1.3	5	T951108	BLOOD	1.3	
828	8-980385	8	AV Slag	25	<	1	5	T951108	BLOOD	0.5	
831	8-980404	8	AV Slag	25	<	1	5	T951108	BLOOD	0.5	
851	8-980402	8	AV Slag	25	<	1	5	T951108	BLOOD	0.5	
806	8-980426	9	AV Slag	75	<	1	5	T951108	BLOOD	0.5	
814	8-980391	9	AV Slag	75		1.6	5	T951108	BLOOD	1.6	
823	8-980399	9	AV Slag	75		1.2	5	T951108	BLOOD	1.2	
847	8-980400	9	AV Slag	75		2.5	5	T951108	BLOOD	2.5	
854	8-980419	9	AV Slag	75		2.3	5	T951108	BLOOD	2.3	
811	8-980431	10	AV Slag	225		2.5	5	T951108	BLOOD	2.5	
822	8-980429	10	AV Slag	225		1.2	5	T951108	BLOOD	1.2	
824	8-980397	10	AV Slag	225		2.6	5	T951108	BLOOD	2.6	
837	8-980417	10	AV Slag	225		4.5	5	T951108	BLOOD	4.5	

pig number	sample	group	material administered	dosage	qualifier	(ug/L)	day	source file	MATRIX	Adjusted Value[a]	Notes
856	8-980435	10	AV Slag	225		1.5	5	T951108	BLOOD	1.5	
809	8-980447	5	Control	0	<	1	7	T951108	BLOOD	0.5	
830	8-980443	5	Control	0	<	1	7	T951108	BLOOD	0.5	
841	8-980488	5	Control	0	<	1	7	T951108	BLOOD	0.5	
848	8-980448	5	Control	0	<	1	7	T951108	BLOOD	0.5	
855	8-980472	5	Control	0	<	1	7	T951108	BLOOD	0.5	
817	8-980489	6	PbAc	25		2.6	7	T951108	BLOOD	2.6	
818	8-980449	6	PbAc	25	<	1	7	T951108	BLOOD	0.5	
819	8-980469	6	PbAc	25		1	7	T951108	BLOOD	1	
838	8-980486	6	PbAc	25		1.8	7	T951108	BLOOD	1.8	
846	8-980483	6	PbAc	25		1.7	7	T951108	BLOOD	1.7	
804	8-980452	7	PbAc	75		3.5	7	T951108	BLOOD	3.5	
840	8-980473	7	PbAc	75		4.1	7	T951108	BLOOD	4.1	
842	8-980480	7	PbAc	75		3.6	7	T951108	BLOOD	3.6	
844	8-980477	7	PbAc	75		2.6	7	T951108	BLOOD	2.6	
849	8-980446	7	PbAc	75	<	1	7	T951108	BLOOD	0.5	
802	8-980442	8	AV Slag	25		1.1	7	T951108	BLOOD	1.1	
826	8-980471	8	AV Slag	25	<	1	7	T951108	BLOOD	0.5	
828	8-980475	8	AV Slag	25	<	1	7	T951108	BLOOD	0.5	
831	8-980465	8	AV Slag	25	<	1	7	T951108	BLOOD	0.5	
851	8-980476	8	AV Slag	25	<	1	7	T951108	BLOOD	0.5	
806	8-980468	9	AV Slag	75	<	1	7	T951108	BLOOD	0.5	
814	8-980450	9	AV Slag	75		1.7	7	T951108	BLOOD	1.7	
823	8-980458	9	AV Slag	75		1	7	T951108	BLOOD	1	
847	8-980438	9	AV Slag	75		2	7	T951108	BLOOD	2	
854	8-980459	9	AV Slag	75		1.7	7	T951108	BLOOD	1.7	
811	8-980474	10	AV Slag	225		2.2	7	T951108	BLOOD	2.2	
822	8-980454	10	AV Slag	225		2.1	7	T951108	BLOOD	2.1	
824	8-980462	10	AV Slag	225		1.3	7	T951108	BLOOD	1.3	
837	8-980485	10	AV Slag	225		3.7	7	T951108	BLOOD	3.7	
856	8-980456	10	AV Slag	225		1.9	7	T951108	BLOOD	1.9	
809	8-980495	5	Control	0	<	1	9	T951108	BLOOD	0.5	
830	8-980541	5	Control	0	<	1	9	T951108	BLOOD	0.5	
841	8-980534	5	Control	0	<	1	9	T951108	BLOOD	0.5	
848	8-980492	5	Control	0	<	1	9	T951108	BLOOD	0.5	
855	8-980507	5	Control	0	<	1	9	T951108	BLOOD	0.5	
817	8-980512	6	PbAc	25		1.8	9	T951108	BLOOD	1.8	
818	8-980543	6	PbAc	25	<	1	9	T951108	BLOOD	0.5	
819	8-980535	6	PbAc	25		1.9	9	T951108	BLOOD	1.9	
838	8-980539	6	PbAc	25		1.7	9	T951108	BLOOD	1.7	
846	8-980536	6	PbAc	25		1.9	9	T951108	BLOOD	1.9	
804	8-980497	7	PbAc	75		3.5	9	T951108	BLOOD	3.5	
840	8-980513	7	PbAc	75		5.4	9	T951108	BLOOD	5.4	
842	8-980538	7	PbAc	75		2.5	9	T951108	BLOOD	2.5	
844	8-980518	7	PbAc	75		3	9	T951108	BLOOD	3	
849	8-980514	7	PbAc	75	<	1	9	T951108	BLOOD	0.5	
802	8-980494	8	AV Slag	25		1.1	9	T951108	BLOOD	1.1	
826	8-980526	8	AV Slag	25	<	1	9	T951108	BLOOD	0.5	
828	8-980523	8	AV Slag	25	<	1	9	T951108	BLOOD	0.5	
831	8-980520	8	AV Slag	25	<	1	9	T951108	BLOOD	0.5	
851	8-980542	8	AV Slag	25	<	1	9	T951108	BLOOD	0.5	
806	8-980491	9	AV Slag	75		1	9	T951108	BLOOD	1	
814	8-980516	9	AV Slag	75		1.6	9	T951108	BLOOD	1.6	
823	8-980498	9	AV Slag	75		2.8	9	T951108	BLOOD	2.8	
847	8-980519	9	AV Slag	75		3	9	T951108	BLOOD	3	
854	8-980496	9	AV Slag	75		2	9	T951108	BLOOD	2	
811	8-980506	10	AV Slag	225		2.2	9	T951108	BLOOD	2.2	
822	8-980530	10	AV Slag	225		2	9	T951108	BLOOD	2	
824	8-980533	10	AV Slag	225		2.8	9	T951108	BLOOD	2.8	
837	8-980521	10	AV Slag	225		3	9	T951108	BLOOD	3	
856	8-980531	10	AV Slag	225		1.8	9	T951108	BLOOD	1.8	
809	8-980560	5	Control	0	<	1	12	T951108	BLOOD	0.5	
830	8-980546	5	Control	0	<	1	12	T951108	BLOOD	0.5	
841	8-980552	5	Control	0	<	1	12	T951108	BLOOD	0.5	
848	8-980565	5	Control	0	<	1	12	T951108	BLOOD	0.5	
855	8-980556	5	Control	0	<	1	12	T951108	BLOOD	0.5	
817	8-980547	6	PbAc	25		2.5	12	T951108	BLOOD	2.5	
818	8-980578	6	PbAc	25		1.8	12	T951108	BLOOD	1.8	
819	8-980569	6	PbAc	25		1.3	12	T951108	BLOOD	1.3	
838	8-980596	6	PbAc	25		2.5	12	T951108	BLOOD	2.5	
846	8-980563	6	PbAc	25		1.6	12	T951108	BLOOD	1.6	
804	8-980570	7	PbAc	75		4.3	12	T951108	BLOOD	4.3	
840	8-980594	7	PbAc	75		5.9	12	T951108	BLOOD	5.9	
842	8-980581	7	PbAc	75		3.3	12	T951108	BLOOD	3.3	
844	8-980577	7	PbAc	75		2.9	12	T951108	BLOOD	2.9	
849	8-980574	7	PbAc	75		2.5	12	T951108	BLOOD	2.5	
802	8-980557	8	AV Slag	25	<	1	12	T951108	BLOOD	0.5	
826	8-980595	8	AV Slag	25		1.1	12	T951108	BLOOD	1.1	
828	8-980589	8	AV Slag	25	<	1	12	T951108	BLOOD	0.5	
831	8-980551	8	AV Slag	25	<	1	12	T951108	BLOOD	0.5	
851	8-980585	8	AV Slag	25		1.7	12	T951108	BLOOD	1.7	
806	8-980592	9	AV Slag	75	<	1	12	T951108	BLOOD	0.5	
814	8-980593	9	AV Slag	75		2	12	T951108	BLOOD	2	
823	8-980573	9	AV Slag	75		2.6	12	T951108	BLOOD	2.6	
847	8-980558	9	AV Slag	75		3.2	12	T951108	BLOOD	3.2	
854	8-980579	9	AV Slag	75		2.6	12	T951108	BLOOD	2.6	
811	8-980591	10	AV Slag	225		2.1	12	T951108	BLOOD	2.1	
822	8-980584	10	AV Slag	225		3.3	12	T951108	BLOOD	3.3	
824	8-980582	10	AV Slag	225		4.3	12	T951108	BLOOD	4.3	
837	8-980580	10	AV Slag	225		2.8	12	T951108	BLOOD	2.8	
856	8-980566	10	AV Slag	225		1.9	12	T951108	BLOOD	1.9	

pig number	sample	group	material administered	dosage	qualifier	(ug/L)	day	source file	MATRIX	Adjusted Value[a]	Notes
809	8-980635	5	Control	0	<	1	15	T951108	BLOOD	0.5	
830	8-980606	5	Control	0	<	1	15	T951108	BLOOD	0.5	
841	8-980605	5	Control	0	<	1	15	T951108	BLOOD	0.5	
848	8-980624	5	Control	0	<	1	15	T951108	BLOOD	0.5	
855	8-980627	5	Control	0	<	1	15	T951108	BLOOD	0.5	
817	8-980600	6	PbAc	25		3.4	15	T951108	BLOOD	3.4	
818	8-980601	6	PbAc	25	<	1	15	T951108	BLOOD	0.5	
819	8-980613	6	PbAc	25		1	15	T951108	BLOOD	1	
838	8-980646	6	PbAc	25		3.7	15	T951108	BLOOD	3.7	
846	8-980642	6	PbAc	25		2.1	15	T951108	BLOOD	2.1	
804	8-980648	7	PbAc	75		5.8	15	T951108	BLOOD	5.8	
840	8-980622	7	PbAc	75		7.6	15	T951108	BLOOD	7.6	
842	8-980637	7	PbAc	75		4.6	15	T951108	BLOOD	4.6	
844	8-980611	7	PbAc	75		4.1	15	T951108	BLOOD	4.1	
849	8-980597	7	PbAc	75		3.1	15	T951108	BLOOD	3.1	
802	8-980631	8	AV Slag	25		1.3	15	T951108	BLOOD	1.3	
826	8-980619	8	AV Slag	25		1.6	15	T951108	BLOOD	1.6	
828	8-980639	8	AV Slag	25	<	1	15	T951108	BLOOD	0.5	
831	8-980626	8	AV Slag	25	<	1	15	T951108	BLOOD	0.5	
851	8-980616	8	AV Slag	25		1.2	15	T951108	BLOOD	1.2	
806	8-980629	9	AV Slag	75	<	1	15	T951108	BLOOD	0.5	
814	8-980599	9	AV Slag	75		3	15	T951108	BLOOD	3	
823	8-980621	9	AV Slag	75		2.3	15	T951108	BLOOD	2.3	
847	8-980630	9	AV Slag	75		3.9	15	T951108	BLOOD	3.9	
854	8-980615	9	AV Slag	75		2.2	15	T951108	BLOOD	2.2	
811	8-980604	10	AV Slag	225		2.5	15	T951108	BLOOD	2.5	
822	8-980617	10	AV Slag	225		3.7	15	T951108	BLOOD	3.7	
824	8-980641	10	AV Slag	225		4.4	15	T951108	BLOOD	4.4	
837	8-980608	10	AV Slag	225		2.7	15	T951108	BLOOD	2.7	
856	8-980607	10	AV Slag	225		2.8	15	T951108	BLOOD	2.8	

a Non-detects evaluated using 1/2 the quantitation limit; laboratory results (ug/L) converted to concentration in blood (ug/dL) by dividing by dilution factor of 1 dL/L

TABLE B-4 BLOOD LEAD OUTLIERS

Flagged Data Points
Outliers (none selected)

test material	target dosage	Actual Dose*	group	pig#	BLOOD LEAD (ug/dL) BY DAY									
					-4	0	1	2	3	5	7	9	12	15
Control	0	0.00	5	809	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Control	0	0.00	5	830	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Control	0	0.00	5	841	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Control	0	0.00	5	848	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Control	0	0.00	5	855	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PbAc	25	23.81	6	817	0.5	0.5	0.5	1.8	2.9	1.7	2.6	1.8	2.5	3.4
PbAc	25	24.20	6	818	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	1.8	0.5
PbAc	25	28.92	6	819	0.5	0.5	0.5	0.5	0.5	3	1	1.9	1.3	1
PbAc	25	24.77	6	838	0.5	0.5	0.5	0.5	1.7	1.3	1.8	1.7	2.5	3.7
PbAc	25	27.43	6	846	0.5	0.5	0.5	1.9	0.5	0.5	1.7	1.9	1.6	2.1
PbAc	75	87.28	7	804	0.5	0.5	0.5	0.5	0.5	2.8	3.5	3.5	4.3	5.8
PbAc	75	66.43	7	840	0.5	0.5	1.7	1.7	2.4	3.2	4.1	5.4	5.9	7.6
PbAc	75	75.75	7	842	0.5	0.5	1.3	1.5	1.7	2.7	3.6	2.5	3.3	4.6
PbAc	75	76.90	7	844	0.5	0.5	1.8	1.8	1.9	2.1	2.6	3	2.9	4.1
PbAc	75	79.20	7	849	0.5	0.5	1.1	0.5	1	1	0.5	0.5	2.5	3.1

*** Average Time and Weight-Adjusted Dose for Each Pig**

TABLE B-5 RATIONALE FOR PbB OUTLIER DECISIONS

NO PbB OUTLIERS SELECTED FOR THIS EXPERIMENT

TABLE B-6 Area Under Curve Determinations

Calculated using interpolated values for missing or excluded data

	AUC (ug/dL-days) For Time Span Shown								
pig#	0-1	1-2	2-3	3-5	5-7	7-9	9-12	12-15	AUC Total (ug/dL-days)
809	0.50	0.50	0.50	1.00	1.00	1.00	1.50	1.50	7.50
830	0.50	0.50	0.50	1.00	1.00	1.00	1.50	1.50	7.50
841	0.50	0.50	0.50	1.00	1.00	1.00	1.50	1.50	7.50
848	0.50	0.50	0.50	1.00	1.00	1.00	1.50	1.50	7.50
855	0.50	0.50	0.50	1.00	1.00	1.00	1.50	1.50	7.50
817	0.50	1.15	2.35	4.60	4.30	4.40	6.45	8.85	32.60
818	0.50	0.50	0.50	1.50	1.50	1.00	3.45	3.45	12.40
819	0.50	0.50	0.50	3.50	4.00	2.90	4.80	3.45	20.15
838	0.50	0.50	1.10	3.00	3.10	3.50	6.30	9.30	27.30
846	0.50	1.20	1.20	1.00	2.20	3.60	5.25	5.55	20.50
804	0.50	0.50	0.50	3.30	6.30	7.00	11.70	15.15	44.95
840	1.10	1.70	2.05	5.60	7.30	9.50	16.95	20.25	64.45
842	0.90	1.40	1.60	4.40	6.30	6.10	8.70	11.85	41.25
844	1.15	1.80	1.85	4.00	4.70	5.60	8.85	10.50	38.45
849	0.80	0.80	0.75	2.00	1.50	1.00	4.50	8.40	19.75
802	0.50	0.50	0.50	1.00	1.60	2.20	2.40	2.70	11.40
826	0.85	0.85	0.50	1.80	1.80	1.00	2.40	4.05	13.25
828	0.50	0.50	0.50	1.00	1.00	1.00	1.50	1.50	7.50
831	0.50	0.50	0.50	1.00	1.00	1.00	1.50	1.50	7.50
851	0.50	0.50	0.50	1.00	1.00	1.00	3.30	4.35	12.15
806	0.50	0.50	0.50	1.00	1.00	1.50	2.25	1.50	8.75
814	1.00	1.00	0.90	2.90	3.30	3.30	5.40	7.50	25.30
823	0.80	0.80	1.00	2.70	2.20	3.80	8.10	7.35	26.75
847	0.50	0.50	1.00	4.00	4.50	5.00	9.30	10.65	35.45
854	0.50	0.75	1.00	3.30	4.00	3.70	6.90	7.20	27.35
811	0.50	0.50	1.65	5.30	4.70	4.40	6.45	6.90	30.40
822	0.50	0.75	1.50	3.20	3.30	4.10	7.95	10.50	31.80
824	0.50	0.75	1.30	4.20	3.90	4.10	10.65	13.05	38.45
837	0.50	0.95	1.55	6.20	8.20	6.70	8.70	8.25	41.05
856	0.50	0.50	1.10	3.20	3.40	3.70	5.55	7.05	25.00

TABLE B - 7 TISSUE LEAD DATA

pig number	sample	group	material administered	dosage	qualifier	Lab result (ug/L)	day	source file	MATRIX	Adjusted Value[a]	Notes
809	8-980814	5	Control	0		3	15	T960131F	FEMUR	1.5	
830	8-980827	5	Control	0	<	2	15	T960131F	FEMUR	0.5	
841	8-980799	5	Control	0	<	2	15	T960131F	FEMUR	0.5	
848	8-980812	5	Control	0	<	2	15	T960131F	FEMUR	0.5	
855	8-980822	5	Control	0	<	2	15	T960131F	FEMUR	0.5	
817	8-980785	6	PbAc	25		5.1	15	T960131F	FEMUR	2.55	
818	8-980788	6	PbAc	25		4.4	15	T960131F	FEMUR	2.2	
819	8-980809	6	PbAc	25		2.8	15	T960131F	FEMUR	1.4	
838	8-980818	6	PbAc	25		7.4	15	T960131F	FEMUR	3.7	
846	8-980787	6	PbAc	25		8.5	15	T960131F	FEMUR	4.25	
804	8-980811	7	PbAc	75		9	15	T960131F	FEMUR	4.5	
840	8-980807	7	PbAc	75		11.1	15	T960131F	FEMUR	5.55	
842	8-980824	7	PbAc	75		13.2	15	T960131F	FEMUR	6.6	
844	8-980791	7	PbAc	75		13	15	T960131F	FEMUR	6.5	
849	8-980816	7	PbAc	75		8.4	15	T960131F	FEMUR	4.2	
802	8-980792	8	AV Slag	25		2.4	15	T960131F	FEMUR	1.2	
826	8-980826	8	AV Slag	25		8.1	15	T960131F	FEMUR	4.05	
828	8-980803	8	AV Slag	25		2.9	15	T960131F	FEMUR	1.45	
831	8-980815	8	AV Slag	25		4.1	15	T960131F	FEMUR	2.05	
851	8-980783	8	AV Slag	25		4.1	15	T960131F	FEMUR	2.05	
806	8-980830	9	AV Slag	75		2.7	15	T960131F	FEMUR	1.35	
814	8-980790	9	AV Slag	75		4.9	15	T960131F	FEMUR	2.45	
823	8-980831	9	AV Slag	75		4.9	15	T960131F	FEMUR	2.45	
847	8-980801	9	AV Slag	75		5.4	15	T960131F	FEMUR	2.7	
854	8-980820	9	AV Slag	75		4	15	T960131F	FEMUR	2	
811	8-980829	10	AV Slag	225		5	15	T960131F	FEMUR	2.5	
822	8-980793	10	AV Slag	225		9.8	15	T960131F	FEMUR	4.9	
824	8-980798	10	AV Slag	225		5	15	T960131F	FEMUR	2.5	
837	8-980817	10	AV Slag	225		8.7	15	T960131F	FEMUR	4.35	
856	8-980784	10	AV Slag	225		5	15	T960131F	FEMUR	2.5	
809	8-980744	5	Control	0		2.1	15	T960120K	KIDNEY	21	
830	8-980770	5	Control	0	<	2	15	T960120K	KIDNEY	10	
841	8-980762	5	Control	0		4	15	T960120K	KIDNEY	40	
848	8-980750	5	Control	0		2.5	15	T960120K	KIDNEY	25	
855	8-980756	5	Control	0		9.1	15	T960120K	KIDNEY	91	
817	8-980765	6	PbAc	25		10.4	15	T960120K	KIDNEY	104	
818	8-980768	6	PbAc	25		3.2	15	T960120K	KIDNEY	32	
819	8-980777	6	PbAc	25		3.5	15	T960120K	KIDNEY	35	
838	8-980743	6	PbAc	25		10	15	T960120K	KIDNEY	100	
846	8-980742	6	PbAc	25		9.8	15	T960120K	KIDNEY	98	
804	8-980751	7	PbAc	75		22	15	T960120K	KIDNEY	220	
840	8-980748	7	PbAc	75		21.4	15	T960120K	KIDNEY	214	
842	8-980764	7	PbAc	75		34.9	15	T960120K	KIDNEY	349	
844	8-980734	7	PbAc	75		23	15	T960120K	KIDNEY	230	
849	8-980749	7	PbAc	75		8.4	15	T960120K	KIDNEY	84	
802	8-980740	8	AV Slag	25		28	15	T960120K	KIDNEY	280	
826	8-980746	8	AV Slag	25		4.9	15	T960120K	KIDNEY	49	
828	8-980758	8	AV Slag	25		11.6	15	T960120K	KIDNEY	116	
831	8-980767	8	AV Slag	25		5.6	15	T960120K	KIDNEY	56	
851	8-980772	8	AV Slag	25	<	2	15	T960120K	KIDNEY	10	
806	8-980766	9	AV Slag	75		1.9	15	T960120K	KIDNEY	19	
814	8-980757	9	AV Slag	75		9.4	15	T960120K	KIDNEY	94	
823	8-980736	9	AV Slag	75		5.7	15	T960120K	KIDNEY	57	
847	8-980780	9	AV Slag	75		6.3	15	T960120K	KIDNEY	63	
854	8-980776	9	AV Slag	75		4.8	15	T960120K	KIDNEY	48	
811	8-980774	10	AV Slag	225		5.8	15	T960120K	KIDNEY	58	
822	8-980773	10	AV Slag	225		13	15	T960120K	KIDNEY	130	
824	8-980752	10	AV Slag	225		8.2	15	T960120K	KIDNEY	82	
837	8-980754	10	AV Slag	225		7.3	15	T960120K	KIDNEY	73	
856	8-980760	10	AV Slag	225		7.6	15	T960120K	KIDNEY	76	
809	8-980696	5	Control	0	<	2	15	T960120L	LIVER	10	
830	8-980690	5	Control	0	<	2	15	T960120L	LIVER	10	
841	8-980700	5	Control	0	<	2	15	T960120L	LIVER	10	
848	8-980714	5	Control	0	<	2	15	T960120L	LIVER	10	
855	8-980694	5	Control	0		8.5	15	T960120L	LIVER	85	
817	8-980685	6	PbAc	25		16.2	15	T960120L	LIVER	162	
818	8-980686	6	PbAc	25		5.2	15	T960120L	LIVER	52	
819	8-980709	6	PbAc	25	<	2	15	T960120L	LIVER	10	
838	8-980728	6	PbAc	25		5.8	15	T960120L	LIVER	58	
846	8-980721	6	PbAc	25		2.7	15	T960120L	LIVER	27	
804	8-980707	7	PbAc	75		23.9	15	T960120L	LIVER	239	
840	8-980693	7	PbAc	75		21.6	15	T960120L	LIVER	216	
842	8-980723	7	PbAc	75		23.6	15	T960120L	LIVER	236	
844	8-980683	7	PbAc	75		15.3	15	T960120L	LIVER	153	
849	8-980698	7	PbAc	75		12.4	15	T960120L	LIVER	124	
802	8-980718	8	AV Slag	25		6.7	15	T960120L	LIVER	67	
826	8-980699	8	AV Slag	25		2.8	15	T960120L	LIVER	28	
828	8-980726	8	AV Slag	25	<	2	15	T960120L	LIVER	10	
831	8-980729	8	AV Slag	25		7	15	T960120L	LIVER	70	
851	8-980725	8	AV Slag	25	<	2	15	T960120L	LIVER	10	
806	8-980689	9	AV Slag	75		2.4	15	T960120L	LIVER	24	
814	8-980692	9	AV Slag	75		7.5	15	T960120L	LIVER	75	
823	8-980680	9	AV Slag	75		5	15	T960120L	LIVER	50	
847	8-980713	9	AV Slag	75		9.5	15	T960120L	LIVER	95	
854	8-980708	9	AV Slag	75		2.7	15	T960120L	LIVER	27	
811	8-980724	10	AV Slag	225		7.7	15	T960120L	LIVER	77	
822	8-980706	10	AV Slag	225		15	15	T960120L	LIVER	150	
824	8-980727	10	AV Slag	225		8.1	15	T960120L	LIVER	81	
837	8-980720	10	AV Slag	225		8.2	15	T960120L	LIVER	82	
856	8-980681	10	AV Slag	225		2.9	15	T960120L	LIVER	29	

a Non-detects evaluated using 1/2 the quantitation limit. Laboratory results (ug/L) converted to tissue concentrations by dividing by sample dilution factors of 0.1 kg/L (liver, kidney) or 2 g/L (ashed bone). Final units are ug Pb/kg wet weight (liver, kidney) or ug Pb/g ashed bone (femur)

TABLE B-8 SUMMARY OF ENDPOINT OUTLIERS

[ ] Selected Outliers

test material	target dosage	Actual Dose*	group	pig#	MEASUREMENT ENDPOINT Blood	Femur	Liver	Kidney
Control	0	0.00	5	**809**	7.5	1.5	10	21
Control	0	0.00	5	**830**	7.5	0.5	10	10
Control	0	0.00	5	**841**	7.5	0.5	10	40
Control	0	0.00	5	**848**	7.5	0.5	10	25
Control	0	0.00	5	**855**	7.5	0.5	85 a	91 a
PbAc	25	23.81	6	**817**	32.6	2.55	162	104
PbAc	25	24.20	6	**818**	12.4	2.2	52	32
PbAc	25	28.92	6	**819**	20.15	1.4	10	35
PbAc	25	24.77	6	**838**	27.3	3.7	58	100
PbAc	25	27.43	6	**846**	20.5	4.25	27	98
PbAc	75	87.28	7	**804**	44.95	4.5	239	220
PbAc	75	66.43	7	**840**	64.45 b	5.55	216	214
PbAc	75	75.75	7	**842**	41.25	6.6	236	349
PbAc	75	76.90	7	**844**	38.45	6.5	153	230
PbAc	75	79.20	7	**849**	19.75	4.2	124	84

a a priori outlier determinations
b Outside 95% Prediction Intervals

TABLE B-9 Best Curve Fit Parameters

BLOOD		BONE		LIVER		KIDNEY	
PbAc Curve -	Exp	PbAc Curve -	Linear	PbAc Curve -	Linear	PbAc Curve -	Linear
a	6.8	a	1.1	a	17.3	a	29.5
b		b	0.057	b	2.202	b	2.355
c	161.3	c		c		c	
d	0.0045	d		d		d	
R2	0.0555	R2	0.766	R2	0.71	R2	0.631
AV Slag Curve -	Exp	AV Slag Curve	Linear	AV Slag Curve	Linear	AV Slag Curve -	Linear
a	6.8	a	1.1	a	17.3	a	29.5
b		b	0.01	b	0.243	b	0.242
c	161.3	c		c		c	
d	0.00088	d		d		d	
R2	0.670	R2	0.587	R2	0.21	R2	0.171

Equations Used	
EXP	Y=a+c*(1-exp(-d*dose))
LIN	Y=a+b*dose

TABLE B-10 Relative Bioavailability of Lead in Test Materials

Endpoint	Test Material AV Slag
Blood	0.20
Kidney	0.10
Liver	0.11
Bone	0.18

Definitions

Plausible Range:	RBA(Blood) to mean RBA for Tissues
Preferred Range:	RBA(Blood) to (RBA(Blood) + RBA(Tissues))/2
Suggested Point Est:	1/2(RBA(Blood) + (RBA(Blood)+RBA(Tissues))/2)

Relative Bioavailability

	AV Slag	
Plausible Range	0.20	0.13
Preferred Range	0.20	0.16
Point Estimate	0.18	

Absolute Bioavailability

	AV Slag	
Plausible Range	10%	6%
Preferred Range	10%	8%
Point Estimate	9%	

TABLE B-11 INTRALABORATORY DUPLICATES

RPD = Relative Percent Difference
RPD = 100*[Orig-Dup]/((Orig+Dup)/2

* Non detects evaluated at 1/2 DL

Orig. pig number	group	material administered	dosage	day	matrix	Duplicate Value*	Original Value*	Average	RPD	Avg RPD	
824	10	AV Slag	225	-4	Blood	0.5	0.5	0.5	0%		
824	10	AV Slag	225	0	Blood	0.5	0.5	0.5	0%		
824	10	AV Slag	225	1	Blood	0.5	0.5	0.5	0%		
824	10	AV Slag	225	2	Blood	0.5	1	0.75	67%		
824	10	AV Slag	225	3	Blood	2.8	1.6	2.2	-55%		
824	10	AV Slag	225	5	Blood	3.7	2.6	3.15	-35%		
824	10	AV Slag	225	7	Blood	3.3	1.3	2.3	-87%		
824	10	AV Slag	225	9	Blood	2.9	2.8	2.85	-4%		
824	10	AV Slag	225	12	Blood	4	4.3	4.15	7%		
824	10	AV Slag	225	15	Blood	4.3	4.4	4.35	2%		
849	7	PbAc	75	-4	Blood	0.5	0.5	0.5	0%		
849	7	PbAc	75	0	Blood	0.5	0.5	0.5	0%		
849	7	PbAc	75	1	Blood	0.5	1.1	0.8	75%		
849	7	PbAc	75	2	Blood	0.5	0.5	0.5	0%		
849	7	PbAc	75	3	Blood	0.5	1	0.75	67%		
849	7	PbAc	75	5	Blood	1.4	1	1.2	-33%		
849	7	PbAc	75	7	Blood	0.5	0.5	0.5	0%		
849	7	PbAc	75	9	Blood	0.5	0.5	0.5	0%		
849	7	PbAc	75	12	Blood	2	2.5	2.25	22%		
849	7	PbAc	75	15	Blood	3.2	3.1	3.15	-3%		
853	3	IV	50	-4	Blood	0.5	0.5	0.5	0%		
853	3	IV	50	0	Blood	0.5	0.5	0.5	0%		
853	3	IV	50	1	Blood	6.7	7.5	7.1	11%		
853	3	IV	50	2	Blood	7.8	6.9	7.35	-12%		
853	3	IV	50	3	Blood	8.2	9	8.6	9%		
853	3	IV	50	5	Blood	9.1	10.1	9.6	10%		
853	3	IV	50	7	Blood	8.9	9	8.95	1%		
853	3	IV	50	9	Blood	8.4	8	8.2	-5%		
853	3	IV	50	12	Blood	8.8	8.4	8.6	-5%		
853	3	IV	50	15	Blood	9.4	10	9.7	6%	0.013	**BLOOD**
824	10	AV Slag	225	15	Femur	3.1	2.5	2.8	-21%		
849	7	PbAc	75	15	Femur	3.5	4.2	3.85	18%		
853	3	IV	50	15	Femur	25.5	22.3	23.9	-13%	-0.055	**FEMUR**
824	10	AV Slag	225	15	Kidney	105	82	93.5	-25%		
849	7	PbAc	75	15	Kidney	107	84	95.5	-24%		
853	3	IV	50	15	Kidney	649	990	819.5	42%	-0.024	**KIDNEY**
824	10	AV Slag	225	15	Liver	30	81	55.5	92%		
849	7	PbAc	75	15	Liver	57	124	90.5	74%		
853	3	IV	50	15	Liver	671	643	657	-4%	0.539	**LIVER**

TABLE B-12 CDC STANDARDS

Sample ID	Day	Q	Measured Low Std	Measured Med Std	Measured High Std	Nominal Concentration
8.1	-4	<	1.0			1.7
8.1	0	<	1.0			1.7
8.1	1	<	1.0			1.7
8.2	-4		3.8			1.7
8.2	0		3.8			1.7
8.2	1			3.8		4.8
8.2	2			3.6		4.8
8.2	3			4		4.8
8.2	5			3.5		4.8
8.2	7			3.6		4.8
8.2	9			3.3		4.8
8.2	12			3.3		4.8
8.2	15			3.1		4.8
8.3	2				12.6	14.9
8.3	3				12.6	14.9
8.3	5				14.9	14.9
8.3	7				15.5	14.9
8.3	9				13.9	14.9
8.3	12				12.7	14.9
8.3	15				14.1	14.9
Averages			2.1	3.5	13.8	NA

TABLE B-13 INTERLABORATORY COMPARISON

Tag Number	Pig Number	Group	Material Administered	Dosage	Qualifier		Result			
					CDC	EPA	CDC	EPA	Average	RPD
8-980271	854	9	AV Slag	75		<	1.5	1.0	1.3	-40
8-980310	809	5	Control	0		<	0.7	1.0	0.9	35
8-980315	814	9	AV Slag	75		<	2.2	1.0	1.6	-75
8-980338	816	4	IV	100			14.5	14.2	14.4	-2
8-980370	817	6	PbAc	25			2.8	2.9	2.9	4
8-980412	836	1	IV	0	U	<	0.6	1.0	0.8	50
8-980401	830	5	Control	0	U	<	0.6	1.0	0.8	50
8-980490	825	3	IV	50			9.1	9.0	9.1	-1
8-980446	849	7	PbAc	75	U	<	0.6	1.0	0.8	50
8-980500	816	4	IV	100			12.8	11.8	12.3	-8
8-980526	826	8	AV Slag	25		<	0.6	1.0	0.8	50
8-980586	807	2	IV	25			10.2	8.5	9.4	-18
8-980568	801	4	IV	100			13.0	11.8	12.4	-10
8-980625	853	3	IV	50			10.6	10.0	10.3	-6
8-980605	841	5	Control	0	U	<	0.6	1.0	0.8	50

FIGURE B-1 PbAc Groups by Day
Raw Data - Phase II Experiment 8

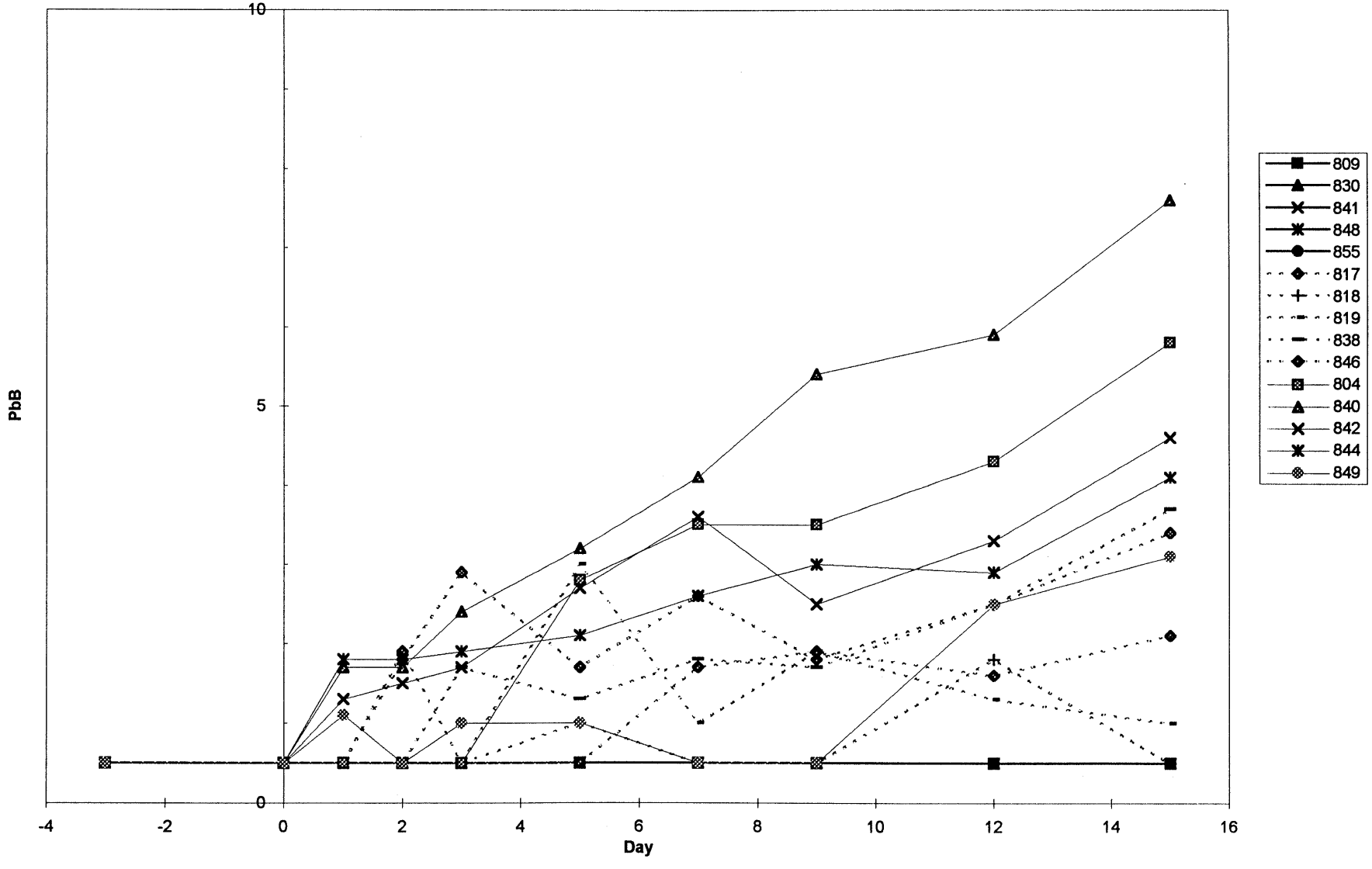


FIGURE B-2 AV Slag Groups by Day
Raw Data - Phase II Experiment 8

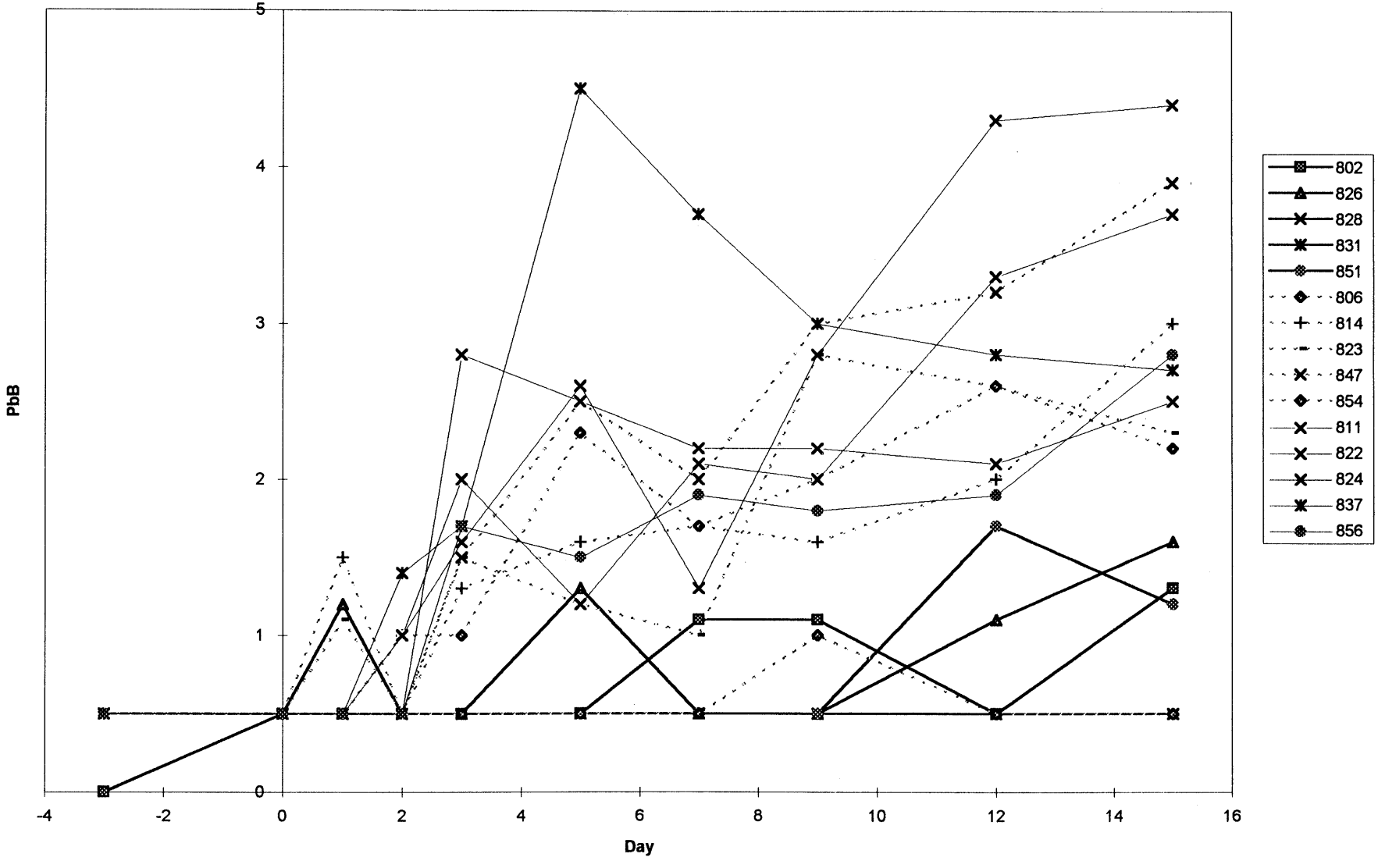


FIGURE B-3

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FIGURE B-4 Group Mean PbB vs. Day
Raw Data

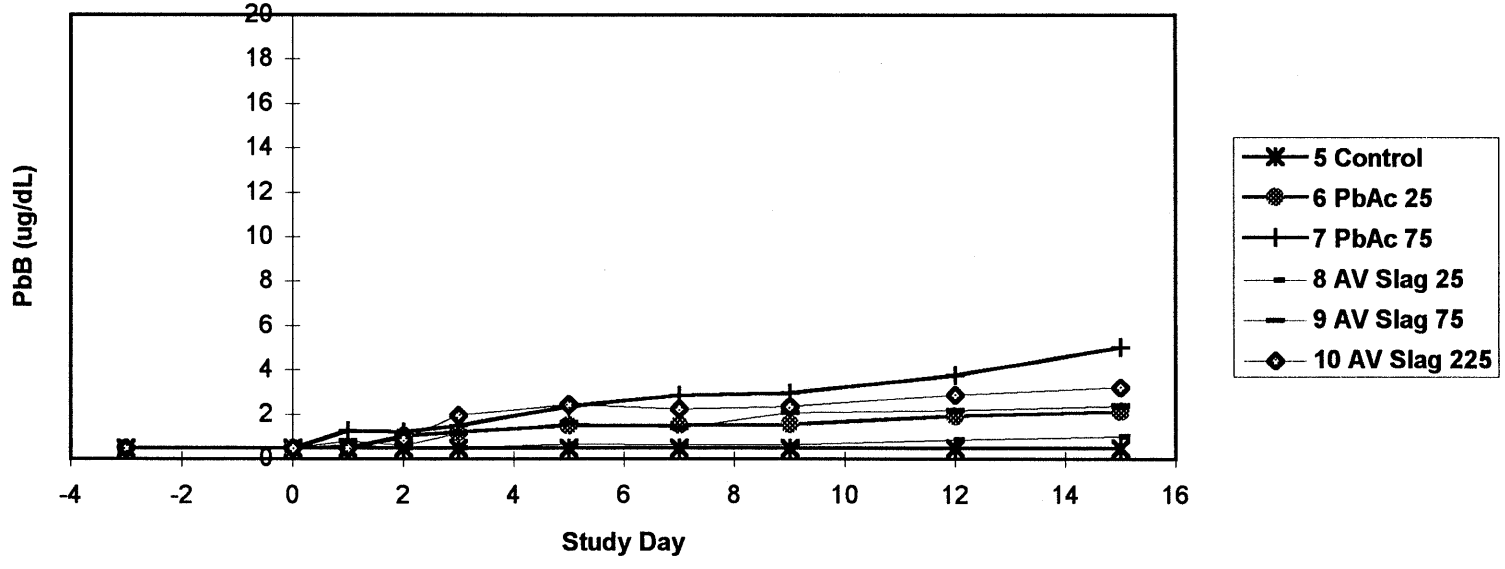
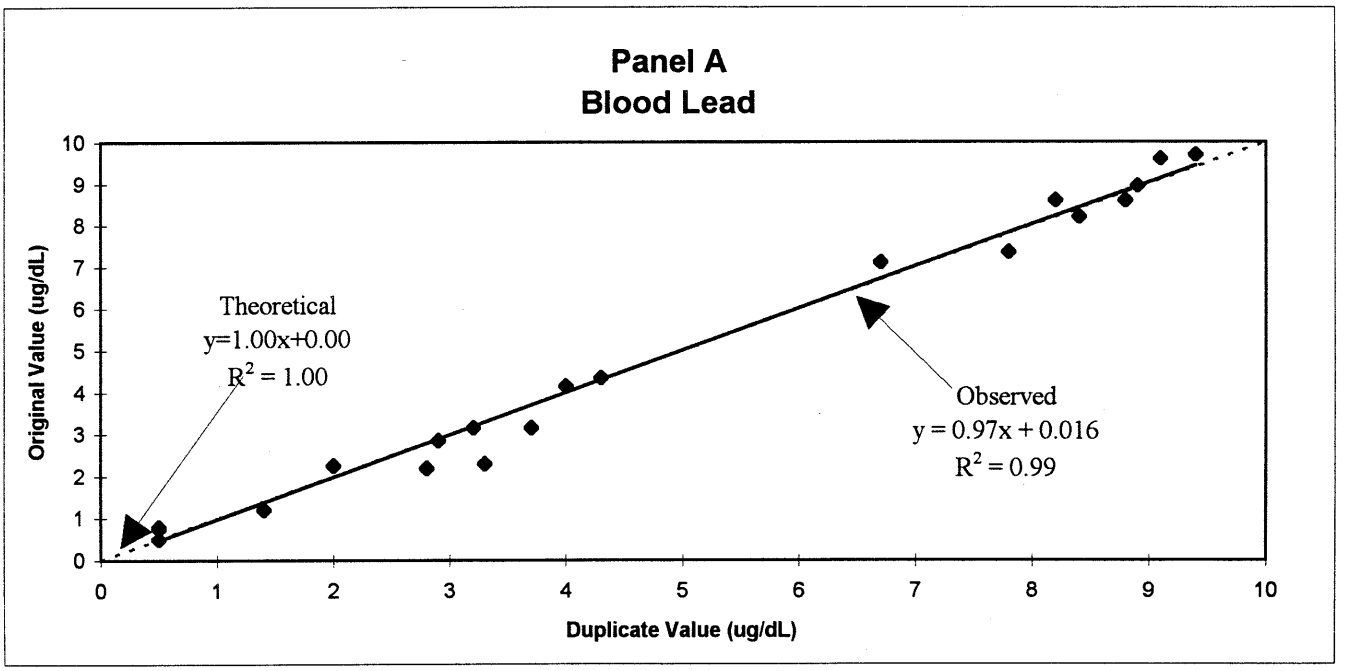


FIGURE B-5 COMPARISION OF DUPLICATE ANALYSES PHASE II EXPERIMENT 8



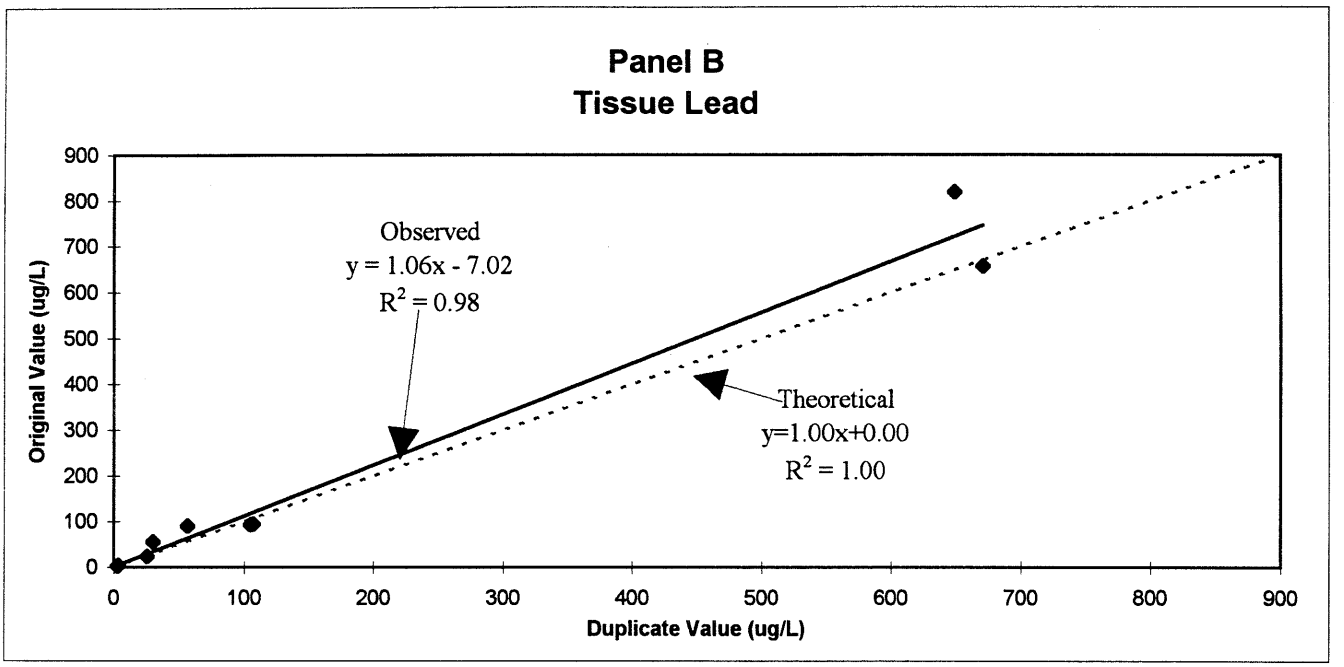
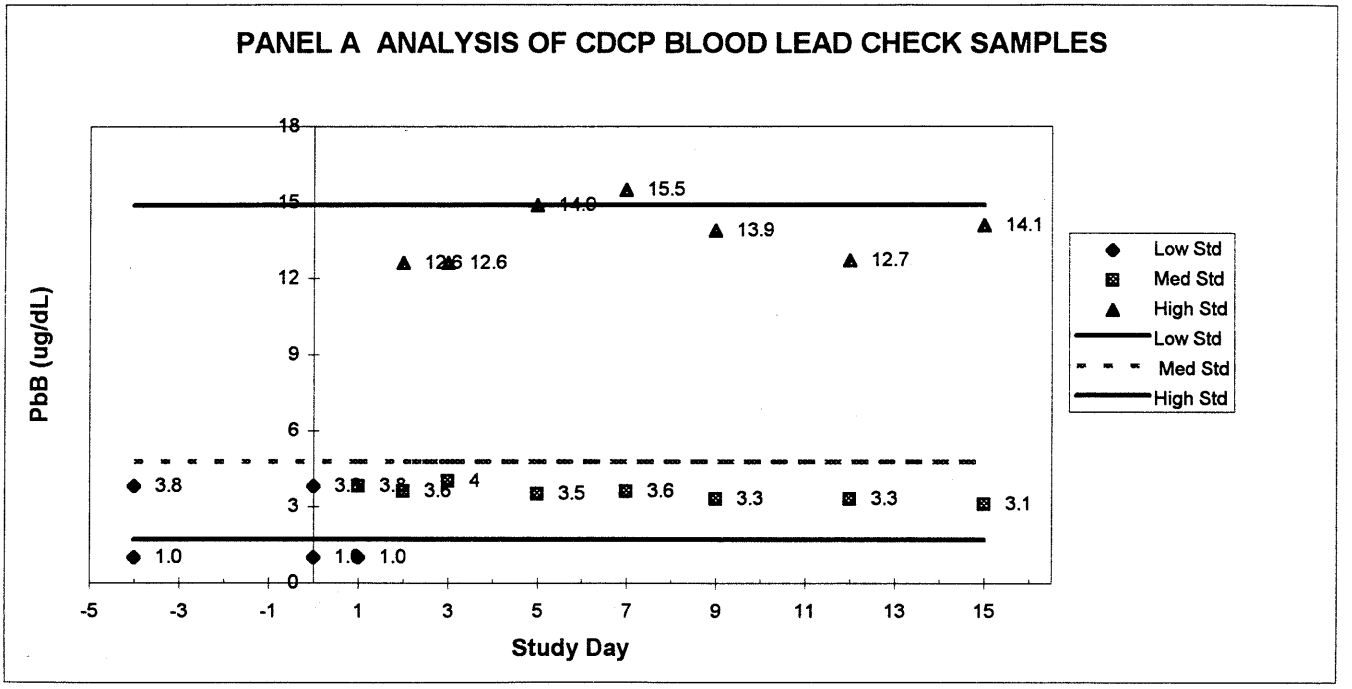


FIGURE B-6 CDCP CHECK SAMPLES FOR PHASE II EXPERIMENT 8



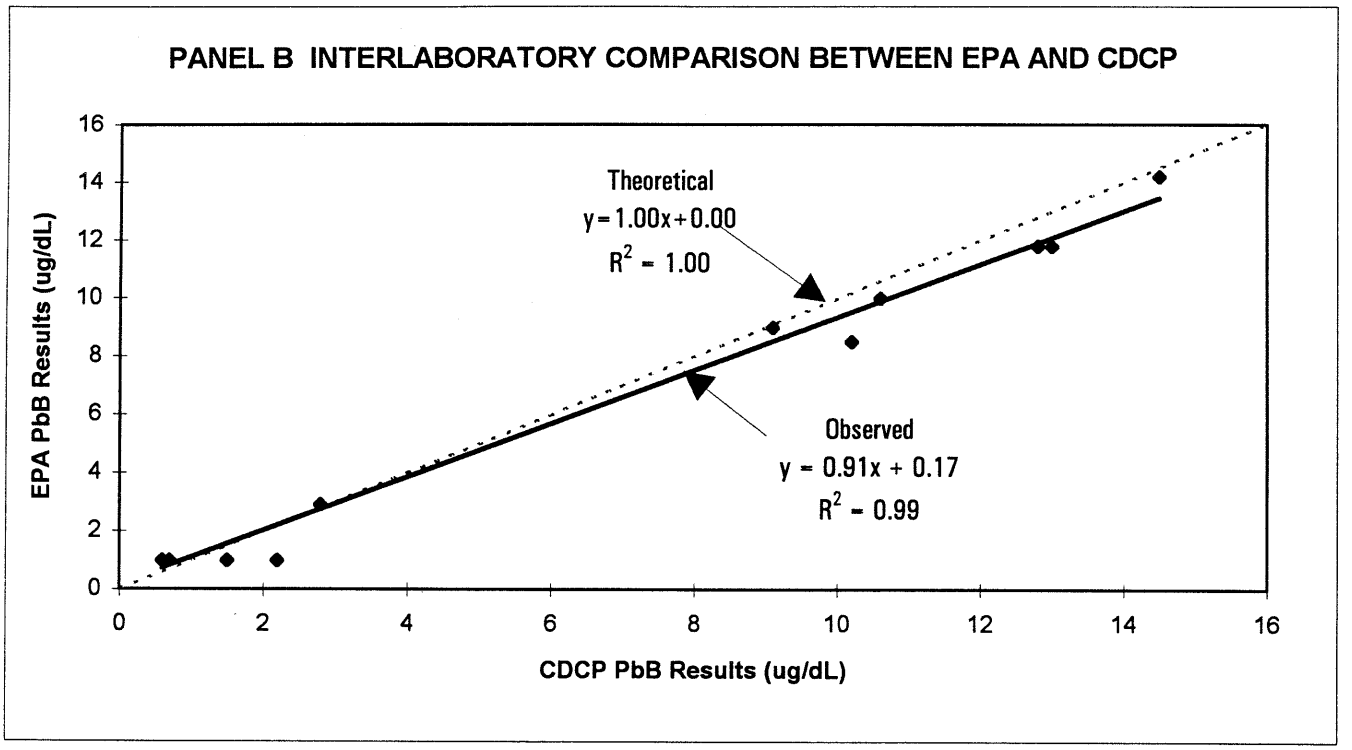
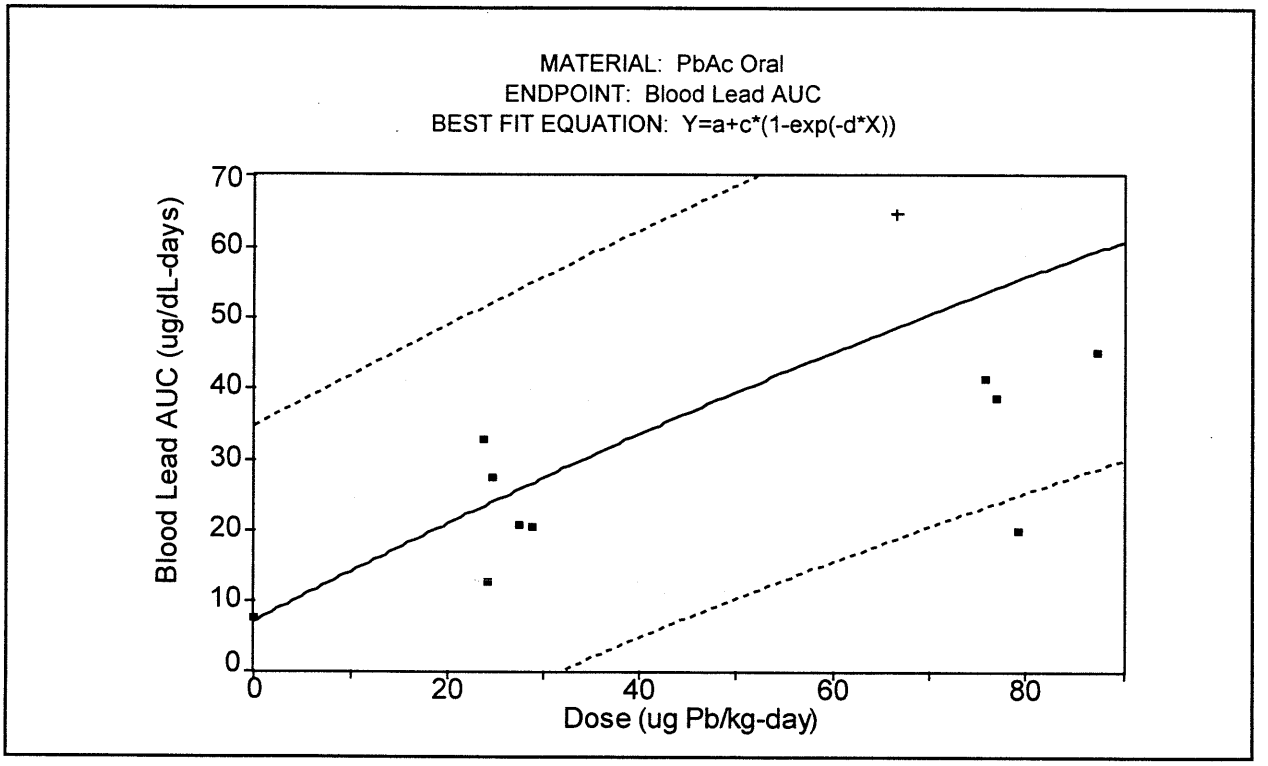


FIGURE B-7 BEST FIT CURVE WITH 95% PREDICTION INTERVALS*

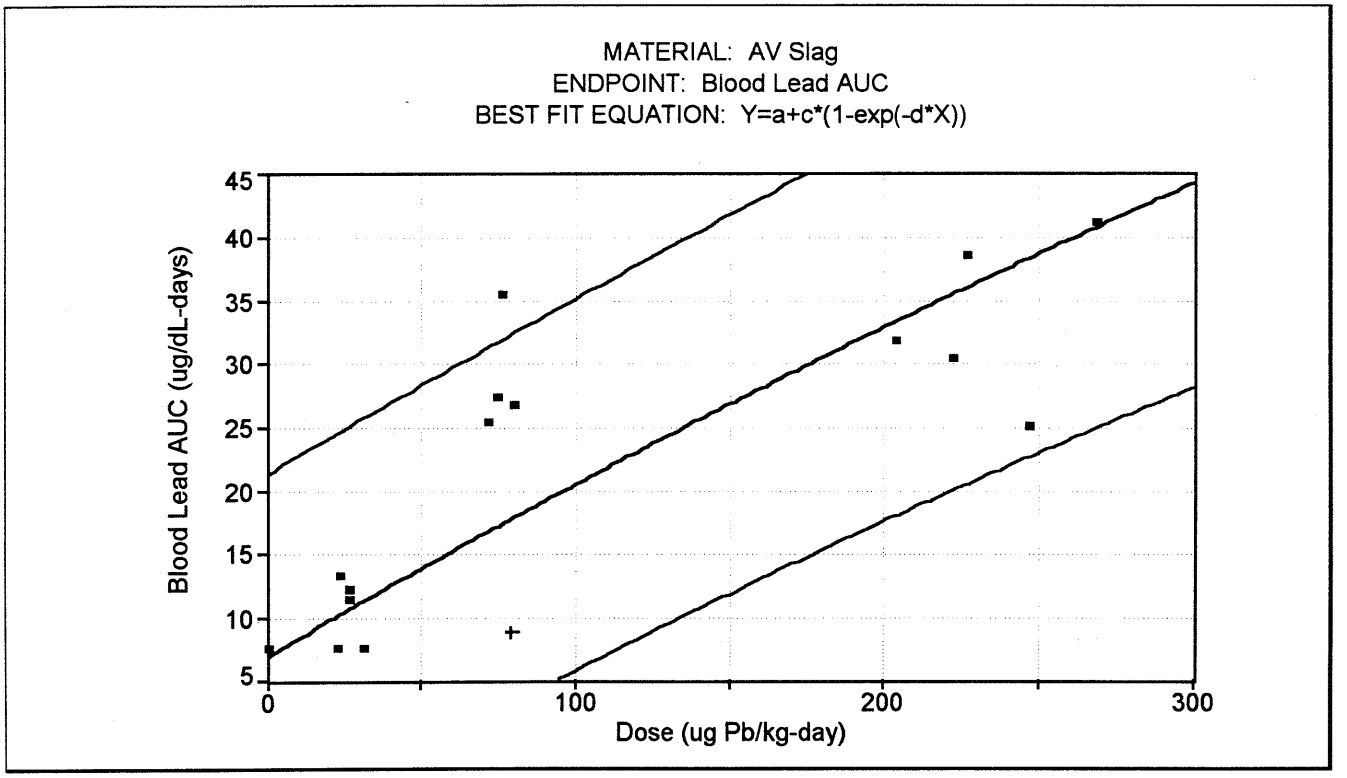


Parameters	Value	Std. Error	95% Confidence Limits	
a	6.8	fixed value	--	--
c	161.3	fixed value	--	--
d	0.0045	0.0006	0.0031	0.0059

Adj R^2	0.0555

*Generated using Table Curve 2D v. 3.0. Outliers represented by "+".

FIGURE B-8 BEST FIT CURVE WITH 95% PREDICTION INTERVALS*

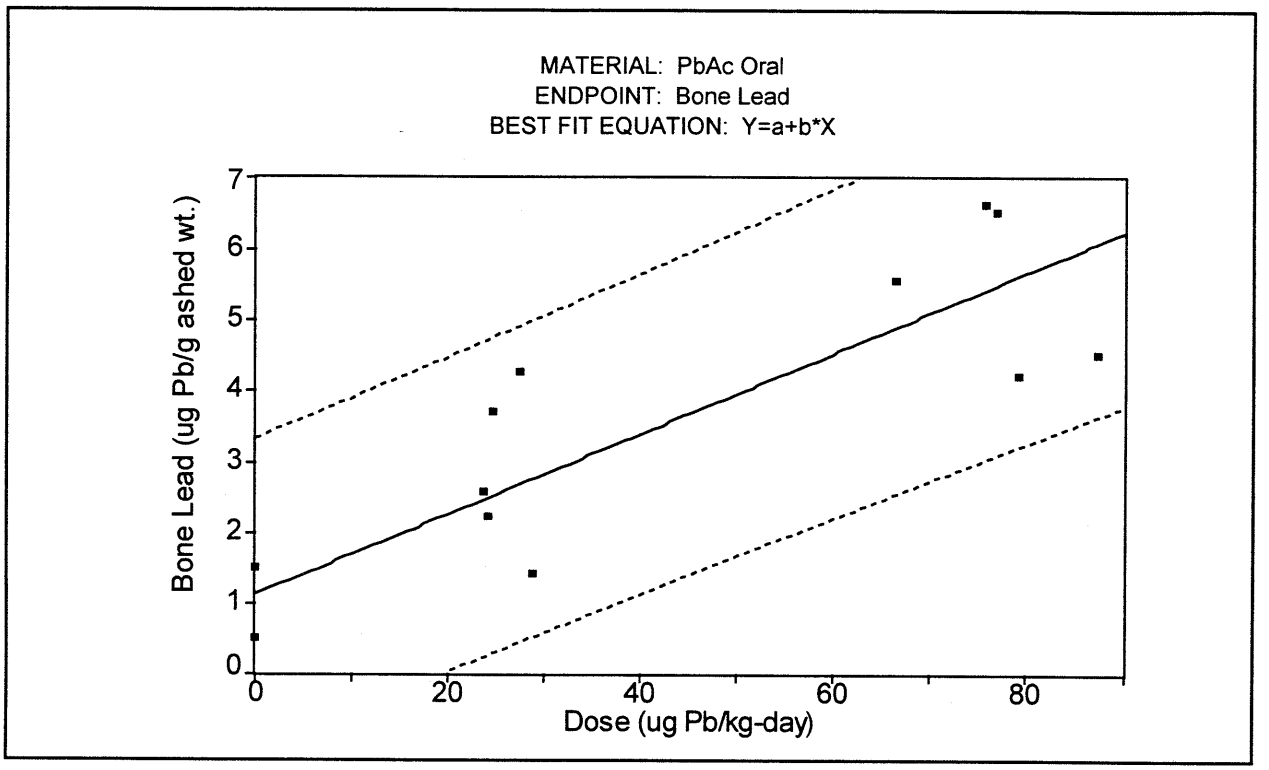


Parameters	Value	Std. Error	95% Confidence Limits	
a	6.8	fixed value	--	--
c	161.3	fixed value	--	--
d	0.0009	9.30E-05	0.00068	0.0011

Adj R^2	0.67

*Generated using Table Curve 2D v. 3.0. Outliers represented by "+".

FIGURE B-9 BEST FIT CURVE WITH 95% PREDICTION INTERVALS*

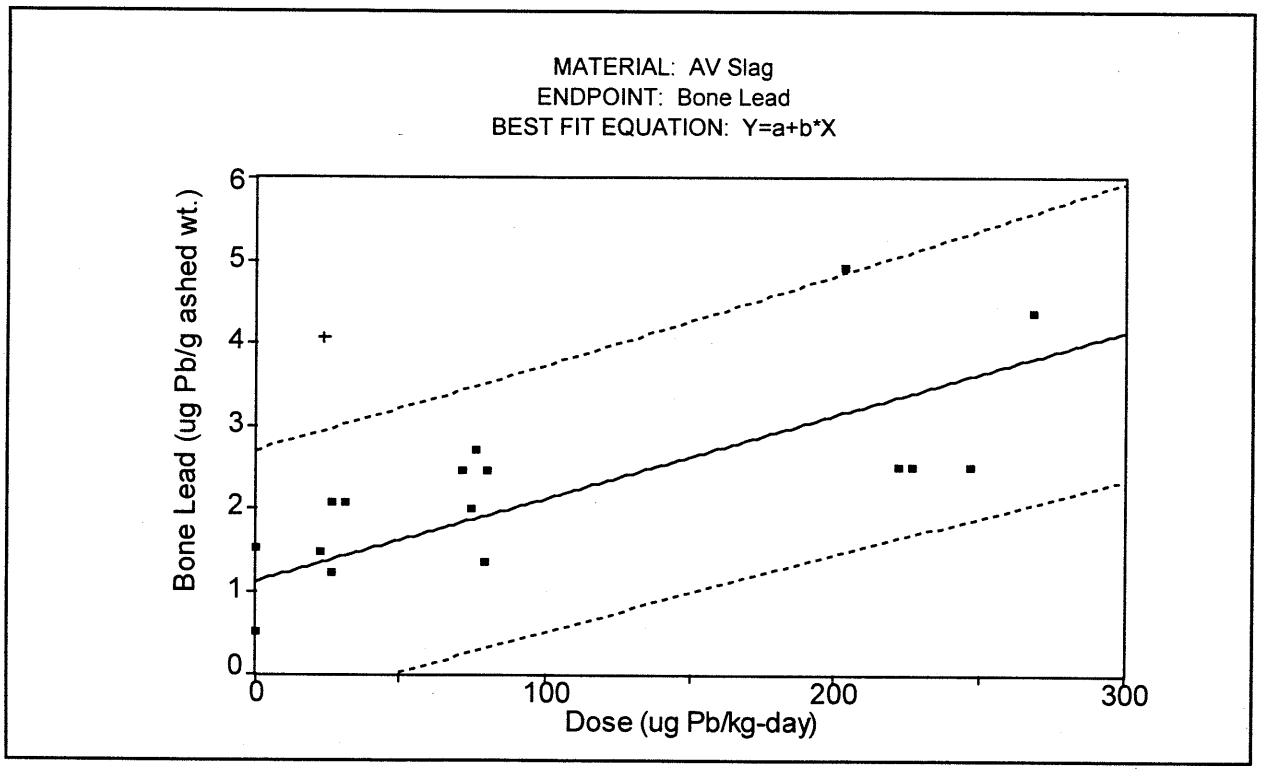


Parameters	Value	Std. Error	95% Confidence Limits	
a	1.1	fixed value	--	--
b	0.057	0.0056	0.045	0.069

Adj R^2	0.766

*Generated using Table Curve 2D v. 3.0. Outliers represented by "+".

FIGURE B-10 BEST FIT CURVE WITH 95% PREDICTION INTERVALS*

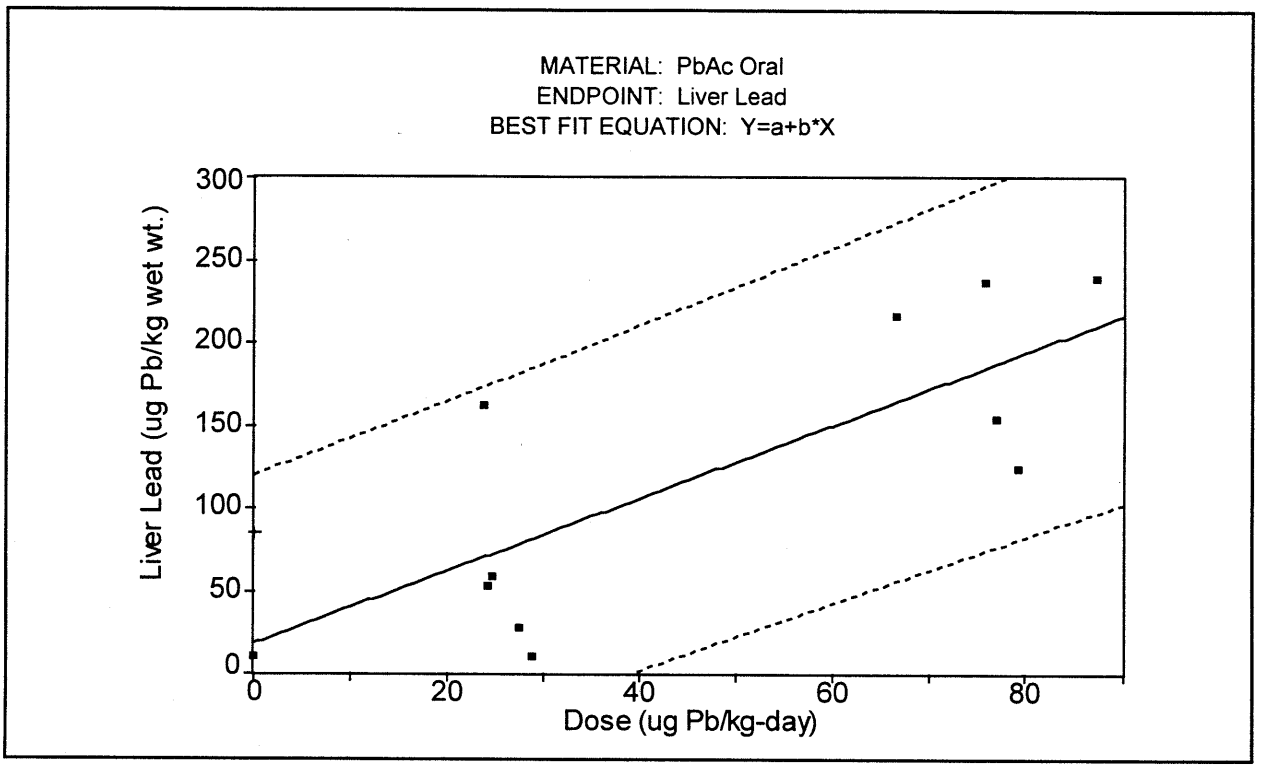


Parameters	Value	Std. Error	95% Confidence Limits	
a	1.1	fixed value	--	--
b	0.010	0.0014	0.0072	0.013

Adj R^2	0.587

*Generated using Table Curve 2D v. 3.0. Outliers represented by "+".

FIGURE B-11 BEST FIT CURVE WITH 95% PREDICTION INTERVALS*

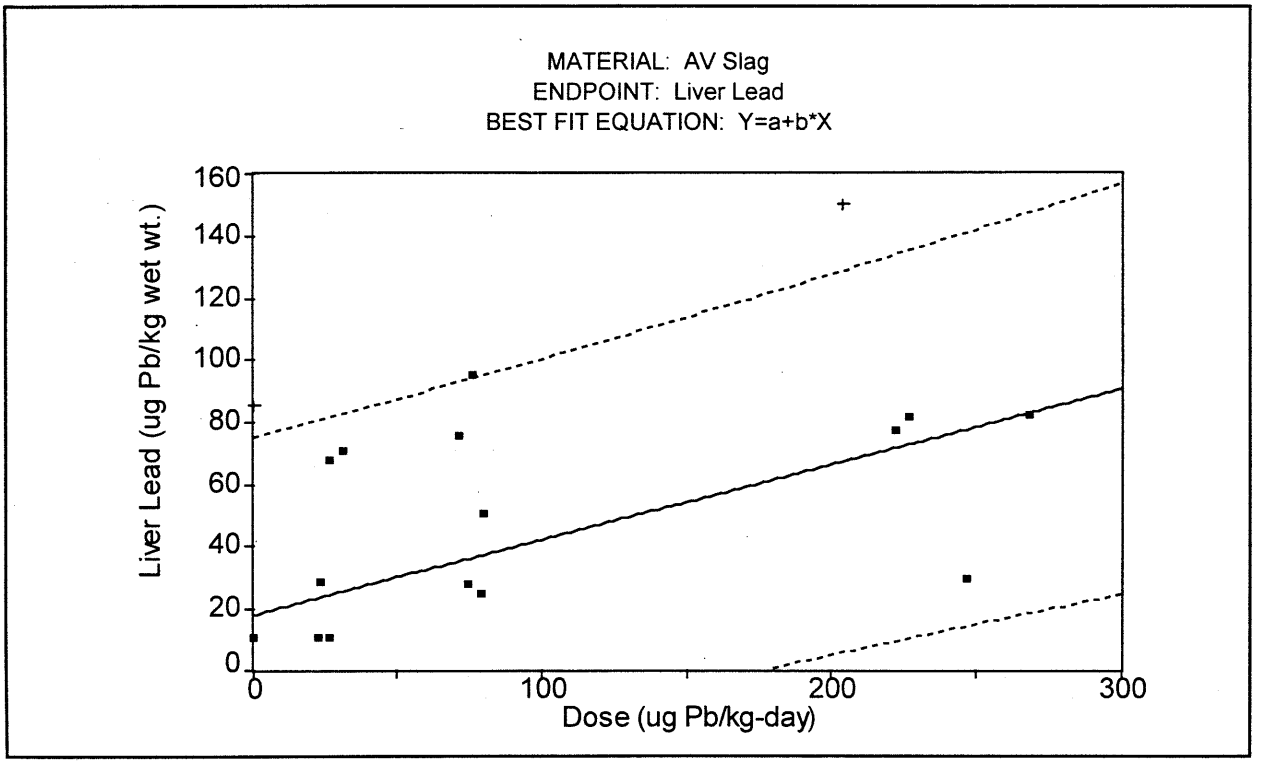


Parameters	Value	Std. Error	95% Confidence Limits	
a	17.3	fixed value	--	--
b	2.202	0.258	1.64	2.76

Adj R^2	0.71

*Generated using Table Curve 2D v. 3.0. Outliers represented by "+".

FIGURE B-12 BEST FIT CURVE WITH 95% PREDICTION INTERVALS*

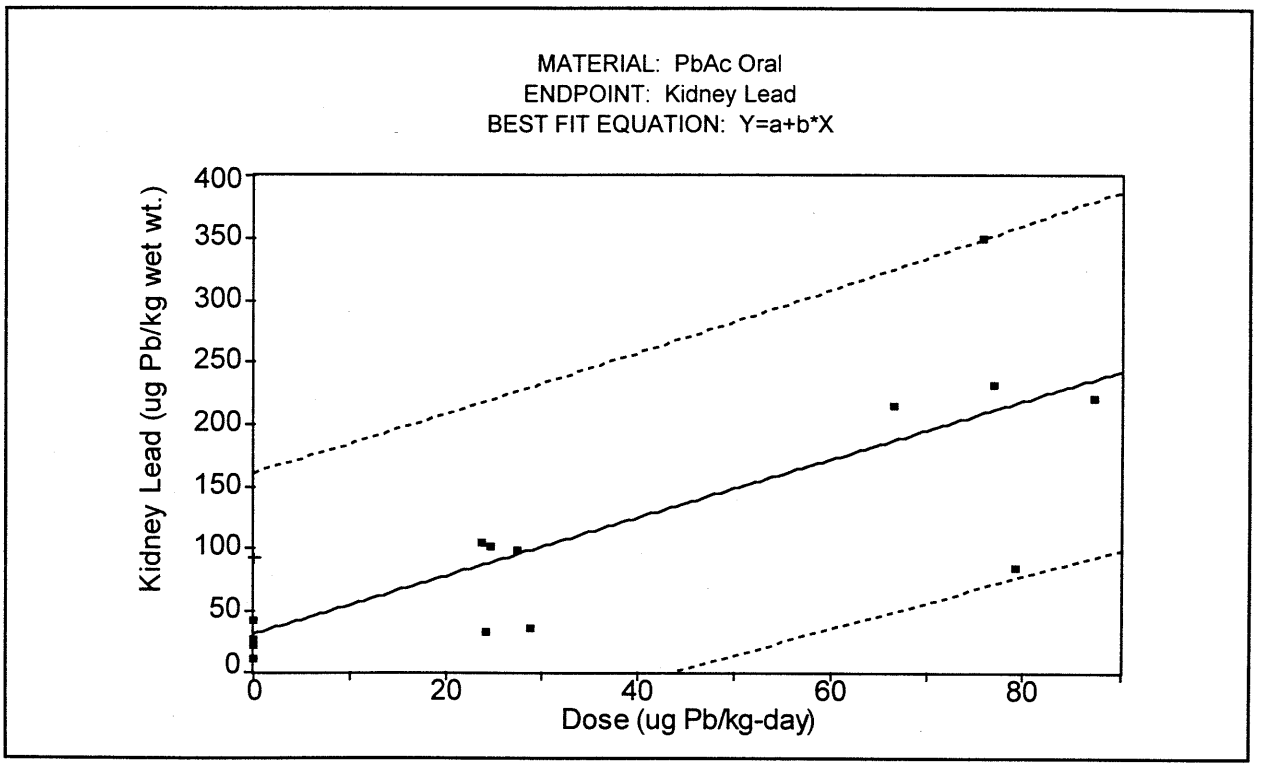


Parameters	Value	Std. Error	95% Confidence Limits	
a	17.3	fixed value	--	--
b	0.243	0.052	0.132	0.354

Adj R^2	0.21

*Generated using Table Curve 2D v. 3.0. Outliers represented by "+".

FIGURE B-13 BEST FIT CURVE WITH 95% PREDICTION INTERVALS*

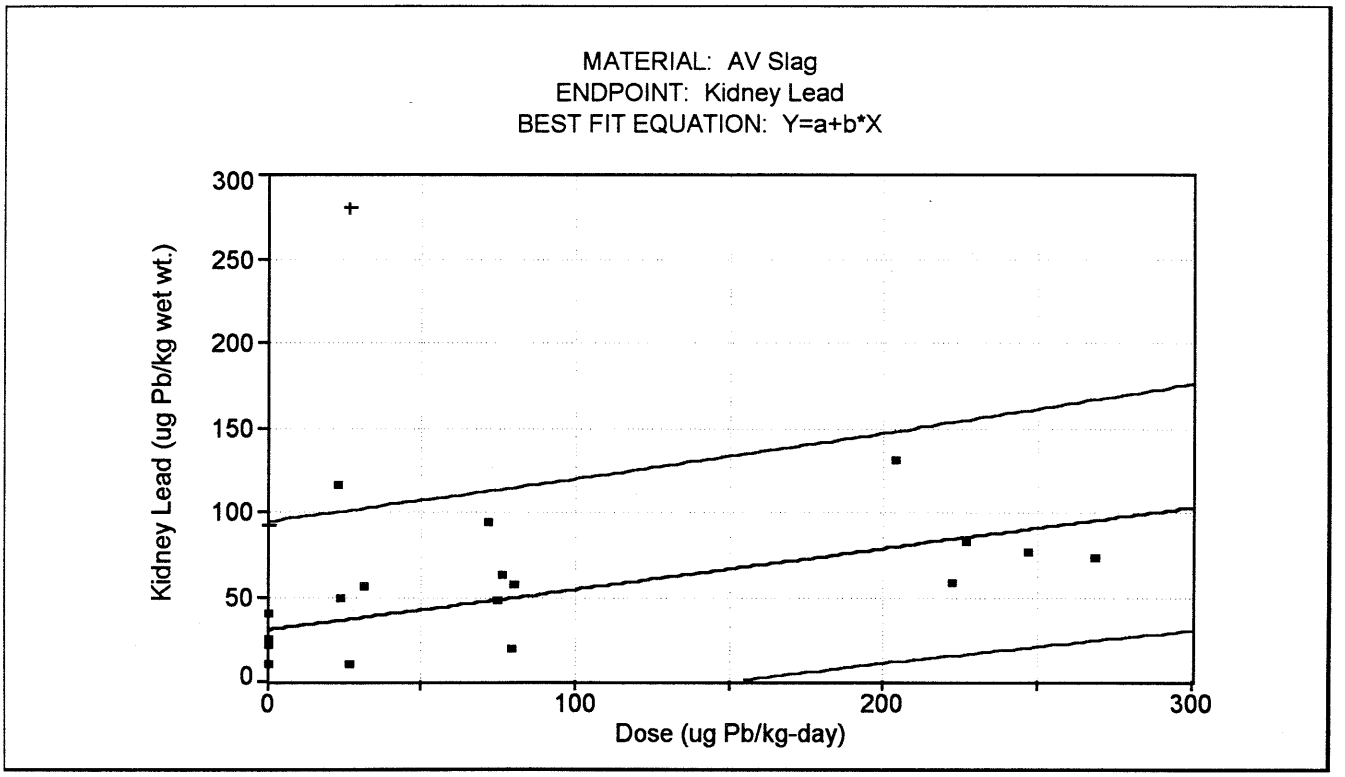


Parameters	Value	Std. Error	95% Confidence Limits	
a	29.5	fixed value	--	--
b	2.35	0.328	1.64	3.07

Adj R^2	0.631

*Generated using Table Curve 2D v. 3.0. Outliers represented by "+".

FIGURE B-14 BEST FIT CURVE WITH 95% PREDICTION INTERVALS*



Parameters	Value	Std. Error	95% Confidence Limits	
a	29.5	fixed value	--	--
b	0.242	0.059	0.118	0.367

Adj R^2	0.171

*Generated using Table Curve 2D v. 3.0. Outliers represented by "+".

SECTION C

STUDY 12

Oregon Gulch Tailings Sample

TABLE C-1 BODY WEIGHTS AND ADMINISTERED DOSES, BY DAY

Body weights were measured on days -1, 2, 5, 8, 11, 14. Weights for other days are estimated, based on linear interpolation between measured values.

Group	ID #	Day -1		Day 0		Day 1		Day 2		Day 3		Day 4		Day 5		Day 6		Day 7		Day 8		Day 9		Day 10		Day 11		Day 12		Day 13		Day 14		Day 15	
		BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day	BW (kg)	ug Pb per day
1	1205	10.28	0.0	10.4	0.0	10.6	0.0	10.7	0.0	11.0	0.0	11.2	0.0	11.5	0.0	11.9	0.0	12.2	0.0	12.62	0.0	13.1	0.0	13.5	0.0	13.94	0.0	14.4	0.0	14.9	0.0	15.38	0.0	15.9	0.0
1	1228	8.24	0.0	8.5	0.0	8.7	0.0	8.96	0.0	9.3	0.0	9.7	0.0	10.02	0.0	10.3	0.0	10.5	0.0	10.72	0.0	11.0	0.0	11.3	0.0	11.54	0.0	11.9	0.0	12.2	0.0	12.56	0.0	12.9	0.0
1	1236	7.96	0.0	8.0	0.0	8.1	0.0	8.2	0.0	8.4	0.0	8.6	0.0	8.82	0.0	9.3	0.0	9.9	0.0	10.38	0.0	10.4	0.0	10.4	0.0	10.48	0.0	10.7	0.0	10.9	0.0	11.12	0.0	11.3	0.0
2	1208	10.5	0.0	10.4	238.5	10.2	238.5	10.08	238.5	10.6	241.5	11.1	241.5	11.64	241.5	11.9	264.1	12.2	264.1	12.42	264.1	12.7	291.6	13.0	291.6	13.28	291.6	13.5	314.3	13.8	314.3	14.06	314.3	14.3	0.0
2	1213	6.22	0.0	6.4	238.5	6.5	238.5	6.7	238.5	7.0	241.5	7.3	241.5	7.64	241.5	8.0	264.1	8.3	264.1	8.58	264.1	8.8	291.6	9.0	291.6	9.26	291.6	9.5	314.3	9.7	314.3	9.92	314.3	10.1	0.0
2	1215	10.16	0.0	10.2	238.5	10.3	238.5	10.34	238.5	10.6	241.5	10.8	241.5	11	241.5	11.3	264.1	11.6	264.1	11.92	264.1	12.2	291.6	12.4	291.6	12.64	291.6	13.1	314.3	13.7	314.3	14.16	314.3	14.7	0.0
2	1217	6.06	0.0	6.1	238.5	6.2	119.3	6.28	238.5	6.5	360.8	6.8	241.5	7.06	241.5	7.5	264.1	7.9	264.1	8.32	264.1	8.7	291.6	9.0	291.6	9.34	291.6	9.6	314.3	9.8	314.3	10.1	314.3	10.4	0.0
2	1248	9.76	0.0	9.8	238.5	9.9	238.5	9.9	238.5	10.1	241.5	10.3	241.5	10.48	241.5	11.0	264.1	11.5	264.1	12.08	264.1	12.5	291.6	12.9	291.6	13.34	291.6	13.7	314.3	14.1	314.3	14.52	314.3	14.9	0.0
3	1227	9.7	0.0	9.8	695.1	9.9	695.1	10.04	695.1	10.2	747.3	10.5	747.3	10.66	747.3	11.1	796.8	11.6	796.8	12.04	796.8	12.5	884.4	13.0	884.4	13.48	884.4	14.0	991.8	14.5	991.8	15.06	991.8	15.6	0.0
3	1240	8.12	0.0	8.3	695.1	8.4	695.1	8.58	695.1	8.9	747.3	9.1	747.3	9.4	747.3	9.7	796.8	10.0	796.8	10.36	796.8	10.8	884.4	11.3	884.4	11.7	884.4	12.2	991.8	12.6	991.8	13.1	991.8	13.6	0.0
3	1243	8	0.0	8.2	695.1	8.4	695.1	8.66	695.1	9.0	747.3	9.3	747.3	9.56	747.3	9.9	796.8	10.2	796.8	10.46	796.8	10.8	884.4	11.2	884.4	11.54	884.4	12.0	991.8	12.4	991.8	12.88	991.8	13.3	0.0
3	1244	8.58	0.0	8.9	695.1	9.2	695.1	9.58	695.1	9.8	747.3	10.0	747.3	10.2	747.3	10.6	796.8	11.0	796.8	11.34	796.8	11.9	884.4	12.5	884.4	13.14	884.4	13.6	991.8	14.1	991.8	14.64	991.8	15.1	0.0
3	1255	6.94	0.0	7.3	695.1	7.6	695.1	7.96	695.1	8.1	747.3	8.2	747.3	8.3	747.3	8.8	796.8	9.3	796.8	9.76	796.8	10.3	884.4	10.8	884.4	11.26	884.4	11.9	991.8	12.4	991.8	13.04	991.8	13.6	0.0
4	1222	6.02	0.0	6.1	1748.7	6.2	1748.7	6.34	1748.7	7.3	1871.1	8.3	1871.1	9.3	1871.1	8.9	2181.6	8.5	2181.6	8.12	2181.6	8.3	2309.4	8.6	2309.4	8.8	2309.4	9.1	2562.3	9.4	2562.3	9.72	2562.3	10.0	0.0
4	1225	5.84	0.0	6.1	1748.7	6.4	1748.7	6.62	1748.7	6.8	1871.1	7.0	1871.1	7.22	1871.1	7.5	2181.6	7.8	2181.6	8.1	2181.6	8.4	2309.4	8.7	2309.4	8.98	2309.4	9.3	2562.3	9.6	2562.3	9.9	2562.3	10.2	0.0
4	1226	6.28	0.0	6.4	1748.7	6.6	1748.7	6.7	1748.7	7.1	1871.1	7.5	1871.1	7.88	1871.1	8.2	2181.6	8.4	2181.6	8.7	2181.6	9.0	2309.4	9.3	2309.4	9.66	2309.4	10.0	2562.3	10.4	2562.3	10.72	2562.3	11.1	0.0
4	1241	7.52	0.0	7.6	1748.7	7.8	1748.7	7.88	1748.7	8.2	1871.1	8.5	1871.1	8.84	1871.1	9.3	2181.6	9.7	2181.6	10.2	2181.6	10.7	2309.4	11.2	2309.4	11.76	2309.4	12.2	2562.3	12.6	2562.3	13.08	2562.3	13.5	0.0
4	1249	8.2	0.0	8.5	1748.7	8.8	1748.7	9.04	1748.7	9.4	1871.1	9.8	1871.1	10.24	1871.1	10.6	2181.6	10.9	2181.6	11.2	2181.6	11.7	2309.4	12.2	2309.4	12.74	2309.4	13.1	2562.3	13.5	2562.3	13.94	2562.3	14.3	0.0
11	1204	7.06	0.0	7.3	1905.8	7.5	1905.8	7.7	1905.8	8.1	2040.8	8.5	2040.8	8.92	2040.8	9.2	2232.0	9.5	2232.0	9.74	2232.0	10.3	2451.4	10.8	2451.4	11.38	2451.4	12.0	2802.4	12.6	2802.4	13.24	2802.4	13.9	0.0
11	1224	7.96	0.0	8.1	1905.8	8.3	1905.8	8.5	1905.8	8.6	2040.8	8.7	2040.8	8.84	2040.8	9.3	2232.0	9.7	2232.0	10.1	2232.0	10.7	2451.4	11.2	2451.4	11.82	2451.4	12.4	2802.4	13.0	2802.4	13.64	2802.4	14.2	0.0
11	1238	7.48	0.0	7.8	1905.8	8.0	1905.8	8.32	1905.8	8.6	2040.8	8.9	2040.8	9.18	2040.8	9.5	2232.0	9.9	2232.0	10.2	2232.0	10.8	2451.4	11.4	2451.4	11.96	2451.4	12.6	2802.4	13.2	2802.4	13.82	2802.4	14.4	0.0
11	1242	7.38	0.0	7.5	1905.8	7.6	1905.8	7.76	1905.8	8.1	2040.8	8.4	2040.8	8.74	2040.8	9.0	2232.0	9.3	2232.0	9.54	2232.0	9.9	2451.4	10.3	2451.4	10.66	2451.4	10.9	2802.4	11.2	2802.4	11.52	2802.4	11.8	0.0

Shaded boxes show days in which administered doses were ingested late

Days which required adjustment due to deviations in dosing (ie. Missed doses)

Day 1 Pig 1217 - did not eat pm dose until next morning. Dose adjusted to 50%

Day 2 Pig 1217 - Ate pm dose from Day 1, Did not eat pm dose for Day 2 until next day.

Day 3 Pig 1217 - Ate pm dose from Day 2 in addition to normal daily doses. Dose adjusted to account for previous day doughball

TABLE C-2

Body Weight Adjusted Doses

(Dose for Day/BW for Day)

Group	ID #	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11	Day 12	Day 13	Day 14	Avg Dose	Target Dose	% Target	Avg %
1	1205	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0		
1	1228	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0		
1	1236	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0		
2	1208	23.02	23.34	23.66	22.78	21.72	20.75	22.19	21.72	21.26	22.95	22.44	21.96	23.21	22.78	22.35	22.4	25	90	
2	1213	37.38	36.47	35.60	34.43	32.96	31.61	33.21	31.95	30.78	33.11	32.28	31.49	33.15	32.40	31.68	33.2	25	133	
2	1215	23.34	23.20	23.07	22.87	22.40	21.95	23.36	22.74	22.16	23.98	23.52	23.07	23.91	23.02	22.20	23.0	25	92	
2	1217	38.89	19.21	37.98	55.16	35.51	34.21	35.31	33.43	31.74	33.67	32.40	31.22	32.76	31.92	31.12	34.3	25	137	
2	1248	24.32	24.21	24.09	23.93	23.48	23.04	23.98	22.87	21.86	23.33	22.57	21.86	22.89	22.25	21.65	23.1	25	92	109
3	1227	70.83	70.02	69.23	72.93	71.49	70.10	71.65	68.81	66.18	70.64	68.03	65.61	70.81	68.24	65.86	69.4	75	92	
3	1240	84.02	82.49	81.01	84.41	81.88	79.50	81.98	79.36	76.91	81.84	78.59	75.59	81.52	78.51	75.71	80.2	75	107	
3	1243	84.56	82.36	80.27	83.40	80.70	78.17	80.81	78.43	76.18	81.74	79.11	76.64	82.74	79.77	77.00	80.1	75	107	
3	1244	77.98	75.17	72.56	76.36	74.78	73.26	75.31	72.70	70.26	74.07	70.53	67.31	72.71	70.14	67.75	72.7	75	97	
3	1255	95.48	91.22	87.32	92.56	91.28	90.04	90.68	85.92	81.64	86.20	82.19	78.54	83.67	79.68	76.06	86.2	75	115	104
4	1222	285.42	280.54	275.82	255.38	225.07	201.19	244.94	256.26	268.67	276.69	269.37	262.43	281.37	272.20	263.61	261.3	225	116	
4	1225	286.67	274.95	264.15	274.35	266.54	259.16	290.36	279.45	269.33	275.15	265.86	257.17	275.91	267.09	258.82	271.0	225	120	
4	1226	272.38	266.57	261.00	263.78	249.92	237.45	267.57	258.89	250.76	256.03	247.26	239.07	255.89	247.17	239.02	254.2	225	113	
4	1241	228.89	225.35	221.92	228.18	219.61	211.66	234.75	223.83	213.88	215.43	205.46	196.38	210.02	202.71	195.89	215.6	225	96	
4	1249	206.21	199.62	193.44	198.21	190.15	182.72	206.59	200.51	194.79	197.16	188.88	181.27	195.00	189.24	183.81	193.8	225	86	106
11	1204	262.02	254.55	247.50	251.74	239.71	228.78	242.78	235.77	229.16	238.31	226.28	215.41	233.53	222.06	211.66	236.0	225	105	
11	1224	234.12	229.06	224.21	236.93	233.85	230.85	241.04	230.58	220.99	229.67	217.96	207.39	225.51	215.02	205.45	225.5	225	100	
11	1238	245.59	237.03	229.06	237.11	229.47	222.30	234.45	226.37	218.82	227.26	215.54	204.96	222.76	212.30	202.78	224.4	225	100	
11	1242	253.87	249.66	245.59	252.36	242.56	233.50	247.82	240.69	233.96	247.28	238.31	229.96	256.00	249.47	243.26	244.3	225	109	103

TABLE C - 3 RAW AND ADJUSTED BLOOD LEAD DATA

PHASE II EXPERIMENT 12

pig number	sample	group	material administered	dosage	qualifier	result	day	source file	MATRIX	Adjusted Value (ug/dL)[a]
1205	8-912-0143	1	Control	0	<	1	-4	T960525B	BLOOD	0.5
1228	8-912-0155	1	Control	0	<	1	-4	T960525B	BLOOD	0.5
1236	8-912-0138	1	Control	0	<	1	-4	T960525B	BLOOD	0.5
1208	8-912-0126	2	PbAc	25	<	1	-4	T960525B	BLOOD	0.5
1213	8-912-0156	2	PbAc	25	<	1	-4	T960525B	BLOOD	0.5
1215	8-912-0135	2	PbAc	25	<	1	-4	T960525B	BLOOD	0.5
1217	8-912-0146	2	PbAc	25	<	1	-4	T960525B	BLOOD	0.5
1248	8-912-0132	2	PbAc	25	<	1	-4	T960525B	BLOOD	0.5
1227	8-912-0124	3	PbAc	75	<	1	-4	T960525B	BLOOD	0.5
1240	8-912-0141	3	PbAc	75	<	1	-4	T960525B	BLOOD	0.5
1243	8-912-0172	3	PbAc	75	<	1	-4	T960525B	BLOOD	0.5
1244	8-912-0150	3	PbAc	75	<	1	-4	T960525B	BLOOD	0.5
1255	8-912-0129	3	PbAc	75	<	1	-4	T960525B	BLOOD	0.5
1222	8-912-0166	4	PbAc	225	<	1	-4	T960525B	BLOOD	0.5
1225	8-912-0122	4	PbAc	225	<	1	-4	T960525B	BLOOD	0.5
1226	8-912-0134	4	PbAc	225	<	1	-4	T960525B	BLOOD	0.5
1241	8-912-0140	4	PbAc	225	<	1	-4	T960525B	BLOOD	0.5
1249	8-912-0165	4	PbAc	225	<	1	-4	T960525B	BLOOD	0.5
1204	8-912-0120	11	Oregon Gulch	225	<	1	-4	T960525B	BLOOD	0.5
1224	8-912-0133	11	Oregon Gulch	225	<	1	-4	T960525B	BLOOD	0.5
1238	8-912-0148	11	Oregon Gulch	225	<	1	-4	T960525B	BLOOD	0.5
1242	8-912-0160	11	Oregon Gulch	225	<	1	-4	T960525B	BLOOD	0.5
1205	8-912-0211	1	Control	0	<	1	0	T960525B	BLOOD	0.5
1228	8-912-0199	1	Control	0	<	1	0	T960525B	BLOOD	0.5
1236	8-912-0229	1	Control	0	<	1	0	T960525B	BLOOD	0.5
1208	8-912-0207	2	PbAc	25	<	1	0	T960525B	BLOOD	0.5
1213	8-912-0218	2	PbAc	25	<	1	0	T960525B	BLOOD	0.5
1215	8-912-0187	2	PbAc	25	<	1	0	T960525B	BLOOD	0.5
1217	8-912-0222	2	PbAc	25	<	1	0	T960525B	BLOOD	0.5
1248	8-912-0202	2	PbAc	25	<	1	0	T960525B	BLOOD	0.5
1227	8-912-0181	3	PbAc	75	<	1	0	T960525B	BLOOD	0.5
1240	8-912-0220	3	PbAc	75	<	1	0	T960525B	BLOOD	0.5
1243	8-912-0194	3	PbAc	75	<	1	0	T960525B	BLOOD	0.5
1244	8-912-0185	3	PbAc	75	<	1	0	T960525B	BLOOD	0.5
1255	8-912-0204	3	PbAc	75	<	1	0	T960525B	BLOOD	0.5
1222	8-912-0215	4	PbAc	225	<	1	0	T960525B	BLOOD	0.5
1225	8-912-0209	4	PbAc	225	<	1	0	T960525B	BLOOD	0.5
1226	8-912-0227	4	PbAc	225	<	1	0	T960525B	BLOOD	0.5
1241	8-912-0192	4	PbAc	225	<	1	0	T960525B	BLOOD	0.5
1249	8-912-0219	4	PbAc	225	<	1	0	T960525B	BLOOD	0.5
1204	8-912-0197	11	Oregon Gulch	225	<	1	0	T960525B	BLOOD	0.5
1224	8-912-0212	11	Oregon Gulch	225	<	1	0	T960525B	BLOOD	0.5
1238	8-912-0189	11	Oregon Gulch	225	<	1	0	T960525B	BLOOD	0.5
1242	8-912-0213	11	Oregon Gulch	225	<	1	0	T960525B	BLOOD	0.5
1205	8-912-0250	1	Control	0	<	1	1	T960610B	BLOOD	0.5
1228	8-912-0280	1	Control	0	<	1	1	T960610B	BLOOD	0.5
1236	8-912-0288	1	Control	0	<	1	1	T960610B	BLOOD	0.5
1208	8-912-0268	2	PbAc	25	<	1	1	T960610B	BLOOD	0.5
1213	8-912-0285	2	PbAc	25		1.3	1	T960610B	BLOOD	1.3
1215	8-912-0287	2	PbAc	25	<	1	1	T960610B	BLOOD	0.5
1217	8-912-0257	2	PbAc	25	<	1	1	T960610B	BLOOD	0.5
1248	8-912-0267	2	PbAc	25	<	1	1	T960610B	BLOOD	0.5
1227	8-912-0259	3	PbAc	75	<	1	1	T960610B	BLOOD	0.5
1240	8-912-0270	3	PbAc	75		2.2	1	T960610B	BLOOD	2.2
1243	8-912-0244	3	PbAc	75	<	1	1	T960610B	BLOOD	0.5
1244	8-912-0274	3	PbAc	75		1.6	1	T960610B	BLOOD	1.6
1255	8-912-0249	3	PbAc	75		1	1	T960610B	BLOOD	1
1222	8-912-0253	4	PbAc	225		1.9	1	T960610B	BLOOD	1.9
1225	8-912-0258	4	PbAc	225		2.5	1	T960610B	BLOOD	2.5
1226	8-912-0264	4	PbAc	225		1.2	1	T960610B	BLOOD	1.2
1241	8-912-0269	4	PbAc	225		3.8	1	T960610B	BLOOD	3.8
1249	8-912-0242	4	PbAc	225		2.1	1	T960610B	BLOOD	2.1
1204	8-912-0266	11	Oregon Gulch	225	<	1	1	T960610B	BLOOD	0.5
1224	8-912-0271	11	Oregon Gulch	225	<	1	1	T960610B	BLOOD	0.5
1238	8-912-0236	11	Oregon Gulch	225	<	1	1	T960610B	BLOOD	0.5
1242	8-912-0246	11	Oregon Gulch	225	<	1	1	T960610B	BLOOD	0.5
1205	8-912-0333	1	Control	0		1.5	2	T960610B	BLOOD	1.5
1228	8-912-0317	1	Control	0	<	1	2	T960610B	BLOOD	0.5
1236	8-912-0295	1	Control	0	<	1	2	T960610B	BLOOD	0.5
1208	8-912-0306	2	PbAc	25	<	1	2	T960610B	BLOOD	0.5
1213	8-912-0297	2	PbAc	25		1.4	2	T960610B	BLOOD	1.4
1215	8-912-0346	2	PbAc	25		2	2	T960610B	BLOOD	2
1217	8-912-0318	2	PbAc	25	<	1	2	T960610B	BLOOD	0.5
1248	8-912-0339	2	PbAc	25	<	1	2	T960610B	BLOOD	0.5
1227	8-912-0304	3	PbAc	75		1.2	2	T960610B	BLOOD	1.2

pig number	sample	group	material administered	dosage	qualifier	result	day	source file	MATRIX	Adjusted Value (ug/dL)[a]
1240	8-912-0342	3	PbAc	75		3.2	2	T960610B	BLOOD	3.2
1243	8-912-0321	3	PbAc	75		1.2	2	T960610B	BLOOD	1.2
1244	8-912-0313	3	PbAc	75		1.9	2	T960610B	BLOOD	1.9
1255	8-912-0308	3	PbAc	75		2.8	2	T960610B	BLOOD	2.8
1222	8-912-0320	4	PbAc	225		5.3	2	T960610B	BLOOD	5.3
1225	8-912-0298	4	PbAc	225		6	2	T960610B	BLOOD	6
1226	8-912-0338	4	PbAc	225		3.1	2	T960610B	BLOOD	3.1
1241	8-912-0312	4	PbAc	225		5.3	2	T960610B	BLOOD	5.3
1249	8-912-0301	4	PbAc	225		5.2	2	T960610B	BLOOD	5.2
1204	8-912-0292	11	Oregon Gulch	225	<	1	2	T960610B	BLOOD	0.5
1224	8-912-0305	11	Oregon Gulch	225	<	1	2	T960610B	BLOOD	0.5
1238	8-912-0303	11	Oregon Gulch	225	<	1	2	T960610B	BLOOD	0.5
1242	8-912-0327	11	Oregon Gulch	225	<	1	2	T960610B	BLOOD	0.5
1205	8-912-0360	1	Control	0	<	1	3	T960610B	BLOOD	0.5
1228	8-912-0361	1	Control	0	<	1	3	T960610B	BLOOD	0.5
1236	8-912-0381	1	Control	0	<	1	3	T960610B	BLOOD	0.5
1208	8-912-0383	2	PbAc	25		1.1	3	T960610B	BLOOD	1.1
1213	8-912-0349	2	PbAc	25		2.4	3	T960610B	BLOOD	2.4
1215	8-912-0365	2	PbAc	25		1.9	3	T960610B	BLOOD	1.9
1217	8-912-0378	2	PbAc	25	<	1	3	T960610B	BLOOD	0.5
1248	8-912-0400	2	PbAc	25		1.2	3	T960610B	BLOOD	1.2
1227	8-912-0382	3	PbAc	75		3.1	3	T960610B	BLOOD	3.1
1240	8-912-0364	3	PbAc	75		3.6	3	T960610B	BLOOD	3.6
1243	8-912-0386	3	PbAc	75		3	3	T960610B	BLOOD	3
1244	8-912-0374	3	PbAc	75		2.2	3	T960610B	BLOOD	2.2
1255	8-912-0363	3	PbAc	75		4.1	3	T960610B	BLOOD	4.1
1222	8-912-0397	4	PbAc	225		6.4	3	T960610B	BLOOD	6.4
1225	8-912-0351	4	PbAc	225		6.8	3	T960610B	BLOOD	6.8
1226	8-912-0354	4	PbAc	225		3.9	3	T960610B	BLOOD	3.9
1241	8-912-0348	4	PbAc	225		7.8	3	T960610B	BLOOD	7.8
1249	8-912-0373	4	PbAc	225		5.5	3	T960610B	BLOOD	5.5
1204	8-912-0362	11	Oregon Gulch	225		1.4	3	T960610B	BLOOD	1.4
1224	8-912-0372	11	Oregon Gulch	225		1.5	3	T960610B	BLOOD	1.5
1238	8-912-0370	11	Oregon Gulch	225	<	1	3	T960610B	BLOOD	0.5
1242	8-912-0375	11	Oregon Gulch	225	<	1	3	T960610B	BLOOD	0.5
1205	8-912-0434	1	Control	0	<	1	5	T960610B	BLOOD	0.5
1228	8-912-0446	1	Control	0	<	1	5	T960610B	BLOOD	0.5
1236	8-912-0445	1	Control	0	<	1	5	T960610B	BLOOD	0.5
1208	8-912-0415	2	PbAc	25		1.2	5	T960610B	BLOOD	1.2
1213	8-912-0432	2	PbAc	25		1	5	T960610B	BLOOD	1
1215	8-912-0423	2	PbAc	25		2.3	5	T960610B	BLOOD	2.3
1217	8-912-0442	2	PbAc	25	<	1	5	T960610B	BLOOD	0.5
1248	8-912-0429	2	PbAc	25		1	5	T960610B	BLOOD	1
1227	8-912-0414	3	PbAc	75		4.7	5	T960610B	BLOOD	4.7
1240	8-912-0406	3	PbAc	75		4.9	5	T960610B	BLOOD	4.9
1243	8-912-0457	3	PbAc	75		3.9	5	T960610B	BLOOD	3.9
1244	8-912-0416	3	PbAc	75		4.9	5	T960610B	BLOOD	4.9
1255	8-912-0407	3	PbAc	75		4.9	5	T960610B	BLOOD	4.9
1222	8-912-0449	4	PbAc	225		8.9	5	T960610B	BLOOD	8.9
1225	8-912-0453	4	PbAc	225		6.1	5	T960610B	BLOOD	6.1
1226	8-912-0421	4	PbAc	225		6.2	5	T960610B	BLOOD	6.2
1241	8-912-0409	4	PbAc	225		7.7	5	T960610B	BLOOD	7.7
1249	8-912-0461	4	PbAc	225		10.1	5	T960610B	BLOOD	10.1
1204	8-912-0412	11	Oregon Gulch	225		1.6	5	T960610B	BLOOD	1.6
1224	8-912-0438	11	Oregon Gulch	225	<	1	5	T960610B	BLOOD	0.5
1238	8-912-0405	11	Oregon Gulch	225		1.6	5	T960610B	BLOOD	1.6
1242	8-912-0413	11	Oregon Gulch	225		1.1	5	T960610B	BLOOD	1.1
1205	8-912-0515	1	Control	0	<	1	7	T960617B	BLOOD	0.5
1228	8-912-0512	1	Control	0	<	1	7	T960617B	BLOOD	0.5
1236	8-912-0518	1	Control	0		1.1	7	T960617B	BLOOD	1.1
1208	8-912-0481	2	PbAc	25	<	1	7	T960610B	BLOOD	0.5
1213	8-912-0467	2	PbAc	25		1.2	7	T960610B	BLOOD	1.2
1215	8-912-0507	2	PbAc	25		2.7	7	T960617B	BLOOD	2.7
1217	8-912-0487	2	PbAc	25		1.1	7	T960617B	BLOOD	1.1
1248	8-912-0478	2	PbAc	25		1.8	7	T960610B	BLOOD	1.8
1227	8-912-0517	3	PbAc	75		2.7	7	T960617B	BLOOD	2.7
1240	8-912-0488	3	PbAc	75		4.9	7	T960617B	BLOOD	4.9
1243	8-912-0490	3	PbAc	75		5.1	7	T960617B	BLOOD	5.1
1244	8-912-0509	3	PbAc	75		4.2	7	T960617B	BLOOD	4.2
1255	8-912-0516	3	PbAc	75		4.5	7	T960617B	BLOOD	4.5
1222	8-912-0503	4	PbAc	225		8.3	7	T960617B	BLOOD	8.3
1225	8-912-0506	4	PbAc	225		7.6	7	T960617B	BLOOD	7.6
1226	8-912-0491	4	PbAc	225		9.7	7	T960617B	BLOOD	9.7
1241	8-912-0497	4	PbAc	225		11.2	7	T960617B	BLOOD	11.2
1249	8-912-0470	4	PbAc	225		8.6	7	T960610B	BLOOD	8.6
1204	8-912-0473	11	Oregon Gulch	225	<	1	7	T960610B	BLOOD	0.5
1224	8-912-0482	11	Oregon Gulch	225		2.1	7	T960617B	BLOOD	2.1
1238	8-912-0464	11	Oregon Gulch	225		1.6	7	T960610B	BLOOD	1.6
1242	8-912-0493	11	Oregon Gulch	225		1	7	T960617B	BLOOD	1
1205	8-912-0539	1	Control	0	<	1	9	T960617B	BLOOD	0.5

pig number	sample	group	material administered	dosage	qualifier	result	day	source file	MATRIX	Adjusted Value (ug/dL)[a]
1228	8-912-0541	1	Control	0	<	1	9	T960617B	BLOOD	0.5
1236	8-912-0570	1	Control	0	<	1	9	T960617B	BLOOD	0.5
1208	8-912-0558	2	PbAc	25		2.2	9	T960617B	BLOOD	2.2
1213	8-912-0562	2	PbAc	25		1.8	9	T960617B	BLOOD	1.8
1215	8-912-0544	2	PbAc	25		2.4	9	T960617B	BLOOD	2.4
1217	8-912-0545	2	PbAc	25	<	1	9	T960617B	BLOOD	0.5
1248	8-912-0547	2	PbAc	25		2.5	9	T960617B	BLOOD	2.5
1227	8-912-0529	3	PbAc	75		2	9	T960617B	BLOOD	2
1240	8-912-0537	3	PbAc	75		6.2	9	T960617B	BLOOD	6.2
1243	8-912-0560	3	PbAc	75		4.7	9	T960617B	BLOOD	4.7
1244	8-912-0540	3	PbAc	75		3.2	9	T960617B	BLOOD	3.2
1255	8-912-0554	3	PbAc	75		5.3	9	T960617B	BLOOD	5.3
1222	8-912-0553	4	PbAc	225		8.7	9	T960617B	BLOOD	8.7
1225	8-912-0575	4	PbAc	225		7.6	9	T960617B	BLOOD	7.6
1226	8-912-0520	4	PbAc	225		9.1	9	T960617B	BLOOD	9.1
1241	8-912-0557	4	PbAc	225		9	9	T960617B	BLOOD	9
1249	8-912-0568	4	PbAc	225		8.8	9	T960617B	BLOOD	8.8
1204	8-912-0519	11	Oregon Gulch	225		1.3	9	T960617B	BLOOD	1.3
1224	8-912-0536	11	Oregon Gulch	225		2.4	9	T960617B	BLOOD	2.4
1238	8-912-0542	11	Oregon Gulch	225		2	9	T960617B	BLOOD	2
1242	8-912-0521	11	Oregon Gulch	225		1.3	9	T960617B	BLOOD	1.3
1205	8-912-0585	1	Control	0	<	1	12	T960622B	BLOOD	0.5
1228	8-912-0616	1	Control	0	<	1	12	T960622B	BLOOD	0.5
1236	8-912-0603	1	Control	0	<	1	12	T960622B	BLOOD	0.5
1208	8-912-0627	2	PbAc	25		1.7	12	T960622B	BLOOD	1.7
1213	8-912-0628	2	PbAc	25		2.6	12	T960622B	BLOOD	2.6
1215	8-912-0612	2	PbAc	25		2.3	12	T960622B	BLOOD	2.3
1217	8-912-0605	2	PbAc	25		1.4	12	T960622B	BLOOD	1.4
1248	8-912-0619	2	PbAc	25		2.6	12	T960622B	BLOOD	2.6
1227	8-912-0602	3	PbAc	75		2.7	12	T960622B	BLOOD	2.7
1240	8-912-0623	3	PbAc	75		5.4	12	T960622B	BLOOD	5.4
1243	8-912-0590	3	PbAc	75		3.3	12	T960622B	BLOOD	3.3
1244	8-912-0595	3	PbAc	75		3.7	12	T960622B	BLOOD	3.7
1255	8-912-0610	3	PbAc	75		5	12	T960622B	BLOOD	5
1222	8-912-0631	4	PbAc	225		8	12	T960622B	BLOOD	8
1225	8-912-0578	4	PbAc	225		10.4	12	T960617B	BLOOD	10.4
1226	8-912-0608	4	PbAc	225		7.9	12	T960622B	BLOOD	7.9
1241	8-912-0622	4	PbAc	225		10.8	12	T960622B	BLOOD	10.8
1249	8-912-0614	4	PbAc	225		8.8	12	T960622B	BLOOD	8.8
1204	8-912-0617	11	Oregon Gulch	225		1.3	12	T960622B	BLOOD	1.3
1224	8-912-0587	11	Oregon Gulch	225		1.8	12	T960622B	BLOOD	1.8
1238	8-912-0632	11	Oregon Gulch	225		2.3	12	T960622B	BLOOD	2.3
1242	8-912-0606	11	Oregon Gulch	225	<	1	12	T960622B	BLOOD	0.5
1205	8-912-0663	1	Control	0	<	1	15	T960622B	BLOOD	0.5
1228	8-912-0679	1	Control	0		1	15	T960622B	BLOOD	1
1236	8-912-0649	1	Control	0	<	1	15	T960622B	BLOOD	0.5
1208	8-912-0674	2	PbAc	25		1.9	15	T960622B	BLOOD	1.9
1213	8-912-0670	2	PbAc	25		3.1	15	T960622B	BLOOD	3.1
1215	8-912-0642	2	PbAc	25		1.3	15	T960622B	BLOOD	1.3
1217	8-912-0677	2	PbAc	25		2.5	15	T960622B	BLOOD	2.5
1248	8-912-0661	2	PbAc	25		1.9	15	T960622B	BLOOD	1.9
1227	8-912-0643	3	PbAc	75		2.3	15	T960622B	BLOOD	2.3
1240	8-912-0660	3	PbAc	75		5.5	15	T960622B	BLOOD	5.5
1243	8-912-0684	3	PbAc	75		6	15	T960622B	BLOOD	6
1244	8-912-0680	3	PbAc	75		6.3	15	T960622B	BLOOD	6.3
1255	8-912-0676	3	PbAc	75		5.3	15	T960622B	BLOOD	5.3
1222	8-912-0650	4	PbAc	225		8.8	15	T960622B	BLOOD	8.8
1225	8-912-0634	4	PbAc	225		8.4	15	T960622B	BLOOD	8.4
1226	8-912-0656	4	PbAc	225		10.1	15	T960622B	BLOOD	10.1
1241	8-912-0633	4	PbAc	225		9.4	15	T960622B	BLOOD	9.4
1249	8-912-0636	4	PbAc	225		5.2	15	T960622B	BLOOD	5.2
1204	8-912-0646	11	Oregon Gulch	225	<	1	15	T960622B	BLOOD	0.5
1224	8-912-0666	11	Oregon Gulch	225		1.9	15	T960622B	BLOOD	1.9
1238	8-912-0671	11	Oregon Gulch	225		3.3	15	T960622B	BLOOD	3.3
1242	8-912-0647	11	Oregon Gulch	225	<	1	15	T960622B	BLOOD	0.5

a Non-detects evaluated using 1/2 the quantitation limit; laboratory results (ug/L) converted to concentration in blood (ug/dL) by dividing by dilution factor of

TABLE C-4 BLOOD LEAD OUTLIERS

Flagged Data Points
Outliers

test material	target dosage	Actual Dose*	group	pig#	BLOOD LEAD (ug/dL) BY DAY									
					-4	0	1	2	3	5	7	9	12	15
Control	0	0.00	1	**1205**	0.5	0.5	0.5	1.5	0.5	0.5	0.5	0.5	0.5	0.5
Control	0	0.00	1	**1228**	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1
Control	0	0.00	1	**1236**	0.5	0.5	0.5	0.5	0.5	0.5	1.1	0.5	0.5	0.5
PbAc	25	22.41	2	**1208**	0.5	0.5	0.5	0.5	1.1	1.2	0.5	2.2	1.7	1.9
PbAc	25	33.23	2	**1213**	0.5	0.5	1.3	1.4	2.4	1	1.2	1.8	2.6	3.1
PbAc	25	22.98	2	**1215**	0.5	0.5	0.5	2	1.9	2.3	2.7	2.4	2.3	1.3
PbAc	25	34.30	2	**1217**	0.5	0.5	0.5	0.5	0.5	0.5	1.1	0.5	1.4	2.5
PbAc	25	23.09	2	**1248**	0.5	0.5	0.5	0.5	1.2	1	1.8	2.5	2.6	1.9
PbAc	75	69.36	3	**1227**	0.5	0.5	0.5	1.2	3.1	4.7	2.7	2	2.7	2.3
PbAc	75	80.22	3	**1240**	0.5	0.5	2.2	3.2	3.6	4.9	4.9	6.2	5.4	5.5
PbAc	75	80.12	3	**1243**	0.5	0.5	0.5	1.2	3	3.9	5.1	4.7	3.3	6
PbAc	75	72.73	3	**1244**	0.5	0.5	1.6	1.9	2.2	4.9	4.2	3.2	3.7	6.3
PbAc	75	86.17	3	**1255**	0.5	0.5	1	2.8	4.1	4.9	4.5	5.3	5	5.3
PbAc	225	261.26	4	**1222**	0.5	0.5	1.9	5.3	6.4	8.9	8.3	8.7	8	8.8
PbAc	225	271.00	4	**1225**	0.5	0.5	2.5	6	6.8	8.1	7.6	7.6	10.4	8.4
PbAc	225	254.18	4	**1226**	0.5	0.5	1.2	3.1	3.9	6.2	9.7	9.1	7.9	10.1
PbAc	225	215.60	4	**1241**	0.5	0.5	3.8	5.3	7.8	7.7	11.2	9	10.8	9.4
PbAc	225	193.84	4	**1249**	0.5	0.5	2.1	5.2	5.5	10.1	8.6	8.8	8.8	5.2
Oregon Gulch	225	235.95	11	**1204**	0.5	0.5	0.5	0.5	1.4	1.6	0.5	1.3	1.3	0.5
Oregon Gulch	225	225.51	11	**1224**	0.5	0.5	0.5	0.5	1.5	0.5	2.1	2.4	1.8	1.9
Oregon Gulch	225	224.39	11	**1238**	0.5	0.5	0.5	0.5	0.5	1.6	1.6	2	2.3	3.3
Oregon Gulch	225	244.29	11	**1242**	0.5	0.5	0.5	0.5	0.5	1.1	1	1.3	0.5	0.5

*** Average Time and Weight-Adjusted Dose for Each Pig**

TABLE C-5 RATIONALE FOR PbB OUTLIER DECISIONS

NO OUTLIERS IDENTIFIED

TABLE C-6 Area Under Curve Determinations

Calculated using interpolated values for missing or excluded data

		AUC (ug/dL-days) For Time Span Shown								AUC Total
group	pig#	0-1	1-2	2-3	3-5	5-7	7-9	9-12	12-15	(ug/dL-days)
1	1205	**0.50**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.50**	**1.50**	8.50
1	1228	**0.50**	**0.50**	**0.50**	**1.00**	**1.00**	**1.00**	**1.50**	**2.25**	8.25
1	1236	**0.50**	**0.50**	**0.50**	**1.00**	**1.60**	**1.60**	**1.50**	**1.50**	8.70
2	1208	**0.50**	**0.50**	**0.80**	**2.30**	**1.70**	**2.70**	**5.85**	**5.40**	19.75
2	1213	**0.90**	**1.35**	**1.90**	**3.40**	**2.20**	**3.00**	**6.60**	**8.55**	27.90
2	1215	**0.50**	**1.25**	**1.95**	**4.20**	**5.00**	**5.10**	**7.05**	**5.40**	30.45
2	1217	**0.50**	**0.50**	**0.50**	**1.00**	**1.60**	**1.60**	**2.85**	**5.85**	14.40
2	1248	**0.50**	**0.50**	**0.85**	**2.20**	**2.80**	**4.30**	**7.65**	**6.75**	25.55
3	1227	**0.50**	**0.85**	**2.15**	**7.80**	**7.40**	**4.70**	**7.05**	**7.50**	37.95
3	1240	**1.35**	**2.70**	**3.40**	**8.50**	**9.80**	**11.10**	**17.40**	**16.35**	70.60
3	1243	**0.50**	**0.85**	**2.10**	**6.90**	**9.00**	**9.80**	**12.00**	**13.95**	55.10
3	1244	**1.05**	**1.75**	**2.05**	**7.10**	**9.10**	**7.40**	**10.35**	**15.00**	53.80
3	1255	**0.75**	**1.90**	**3.45**	**9.00**	**9.40**	**9.80**	**15.45**	**15.45**	65.20
4	1222	**1.20**	**3.60**	**5.85**	**15.30**	**17.20**	**17.00**	**25.05**	**25.20**	110.40
4	1225	**1.50**	**4.25**	**6.40**	**12.90**	**13.70**	**15.20**	**27.00**	**28.20**	109.15
4	1226	**0.85**	**2.15**	**3.50**	**10.10**	**15.90**	**18.80**	**25.50**	**27.00**	103.80
4	1241	**2.15**	**4.55**	**6.55**	**15.50**	**18.90**	**20.20**	**29.70**	**30.30**	127.85
4	1249	**1.30**	**3.65**	**5.35**	**15.60**	**18.70**	**17.40**	**26.40**	**21.00**	109.40
11	1204	**0.50**	**0.50**	**0.95**	**3.00**	**2.10**	**1.80**	**3.90**	**2.70**	15.45
11	1224	**0.50**	**0.50**	**1.00**	**2.00**	**2.60**	**4.50**	**6.30**	**5.55**	22.95
11	1238	**0.50**	**0.50**	**0.50**	**2.10**	**3.20**	**3.60**	**6.45**	**8.40**	25.25
11	1242	**0.50**	**0.50**	**0.50**	**1.60**	**2.10**	**2.30**	**2.70**	**1.50**	11.70

TABLE C - 7 TISSUE LEAD DATA

PHASE II EXPERIMENT 12

pig number	sample	group	material administered	dosage	qualifier	result	day	source file	MATRIX	Adjusted Value (ug/dL)[a]
1205	8-912-0711	1	Control	0	<	2	15	T980717F	FEMUR	0.5
1228	8-912-0710	1	Control	0	<	2	15	T980717F	FEMUR	0.5
1236	8-912-0694	1	Control	0	<	2	15	T980717F	FEMUR	0.5
1208	8-912-0706	2	PbAc	25	<	2	15	T980717F	FEMUR	0.5
1213	8-912-0729	2	PbAc	25		4.1	15	T980717F	FEMUR	2.05
1215	8-912-0732	2	PbAc	25		4.6	15	T980717F	FEMUR	2.3
1217	8-912-0690	2	PbAc	25	<	2	15	T980717F	FEMUR	0.5
1248	8-912-0739	2	PbAc	25		2.3	15	T980717F	FEMUR	1.15
1227	8-912-0702	3	PbAc	75	<	2	15	T980717F	FEMUR	0.5
1240	8-912-0713	3	PbAc	75		6.5	15	T980717F	FEMUR	3.25
1243	8-912-0726	3	PbAc	75		10	15	T980717F	FEMUR	5
1244	8-912-0737	3	PbAc	75		10.5	15	T980717F	FEMUR	5.25
1255	8-912-0704	3	PbAc	75		7.1	15	T980717F	FEMUR	3.55
1222	8-912-0698	4	PbAc	225		18.6	15	T980717F	FEMUR	9.3
1225	8-912-0718	4	PbAc	225		18.2	15	T980717F	FEMUR	9.1
1226	8-912-0721	4	PbAc	225		24.1	15	T980717F	FEMUR	12.05
1241	8-912-0716	4	PbAc	225		8.7	15	T980717F	FEMUR	4.35
1249	8-912-0701	4	PbAc	225		7.5	15	T980717F	FEMUR	3.75
1204	8-912-0727	11	Oregon Gulch	225		2.2	15	T980717F	FEMUR	1.1
1224	8-912-0708	11	Oregon Gulch	225	<	2	15	T980717F	FEMUR	0.5
1238	8-912-0695	11	Oregon Gulch	225	<	2	15	T980717F	FEMUR	0.5
1242	8-912-0691	11	Oregon Gulch	225	<	2	15	T980717F	FEMUR	0.5
1205	8-912-0829	1	Control	0	<	2	15	T960708K	KIDNEY	10
1228	8-912-0806	1	Control	0	<	2	15	T960708K	KIDNEY	10
1236	8-912-0847	1	Control	0	<	2	15	T960708K	KIDNEY	10
1208	8-912-0810	2	PbAc	25		3.1	15	T960708K	KIDNEY	31
1213	8-912-0822	2	PbAc	25		2.8	15	T960708K	KIDNEY	28
1215	8-912-0836	2	PbAc	25		5.3	15	T960708K	KIDNEY	53
1217	8-912-0808	2	PbAc	25		1.8	15	T960708K	KIDNEY	18
1248	8-912-0832	2	PbAc	25		270	15	T960708K	KIDNEY	2700
1227	8-912-0801	3	PbAc	75		10.7	15	T960708K	KIDNEY	107
1240	8-912-0835	3	PbAc	75		14.5	15	T960708K	KIDNEY	145
1243	8-912-0813	3	PbAc	75		11.7	15	T960708K	KIDNEY	117
1244	8-912-0814	3	PbAc	75		11.5	15	T960708K	KIDNEY	115
1255	8-912-0833	3	PbAc	75		12.2	15	T960708K	KIDNEY	122
1222	8-912-0819	4	PbAc	225		20.1	15	T960708K	KIDNEY	201
1225	8-912-0845	4	PbAc	225		24.9	15	T960708K	KIDNEY	249
1226	8-912-0830	4	PbAc	225		31.7	15	T960708K	KIDNEY	317
1241	8-912-0837	4	PbAc	225		26.4	15	T960708K	KIDNEY	264
1249	8-912-0848	4	PbAc	225		33.3	15	T960708K	KIDNEY	333
1204	8-912-0838	11	Oregon Gulch	225		2	15	T960708K	KIDNEY	20
1224	8-912-0851	11	Oregon Gulch	225	<	2	15	T960708K	KIDNEY	10
1238	8-912-0805	11	Oregon Gulch	225		4.3	15	T960708K	KIDNEY	43
1242	8-912-0817	11	Oregon Gulch	225	<	2	15	T960708K	KIDNEY	10
1205	8-912-0780	1	Control	0		2.5	15	T960625L	LIVER	25
1228	8-912-0772	1	Control	0	<	2	15	T960625L	LIVER	10
1236	8-912-0791	1	Control	0		3.2	15	T960625L	LIVER	32
1208	8-912-0752	2	PbAc	25		2.5	15	T960625L	LIVER	25
1213	8-912-0745	2	PbAc	25		2.3	15	T960625L	LIVER	23
1215	8-912-0799	2	PbAc	25		2.8	15	T960625L	LIVER	28
1217	8-912-0760	2	PbAc	25	<	2	15	T960625L	LIVER	10
1248	8-912-0754	2	PbAc	25		2.1	15	T960625L	LIVER	21
1227	8-912-0797	3	PbAc	75		7.4	15	T960625L	LIVER	74
1240	8-912-0773	3	PbAc	75		14.6	15	T960625L	LIVER	146
1243	8-912-0792	3	PbAc	75		9.5	15	T960625L	LIVER	95
1244	8-912-0789	3	PbAc	75		11.9	15	T960625L	LIVER	119
1255	8-912-0750	3	PbAc	75		10.3	15	T960625L	LIVER	103
1222	8-912-0769	4	PbAc	225		29.3	15	T960625L	LIVER	293
1225	8-912-0759	4	PbAc	225		22.7	15	T960625L	LIVER	227
1226	8-912-0794	4	PbAc	225		36	15	T960625L	LIVER	360
1241	8-912-0785	4	PbAc	225		22.8	15	T960625L	LIVER	228
1249	8-912-0768	4	PbAc	225		60.6	15	T960625L	LIVER	606
1204	8-912-0788	11	Oregon Gulch	225		2.6	15	T960625L	LIVER	26
1224	8-912-0748	11	Oregon Gulch	225		2.2	15	T960625L	LIVER	22
1238	8-912-0784	11	Oregon Gulch	225		5.1	15	T960625L	LIVER	51
1242	8-912-0749	11	Oregon Gulch	225	<	2	15	T960625L	LIVER	10

a Non-detects evaluated using 1/2 the quantitation limit. Laboratory results (ug/L) converted to tissue concentrations by dividing by sample dilution factors 0.1 kg/L (liver, kidney) or 2 g/L (ashed bone). Final units are ug Pb/kg wet weight (liver, kidney) or ug Pb/g ashed bone (femur)

TABLE C-8 SUMMARY OF ENDPOINT OUTLIERS

Selected Outliers

test material	target dosage	Actual Dose*	group	pig#	MEASUREMENT ENDPOINT Blood	Femur	Liver	Kidney
Control	0	0.00	1	1205	8.5	0.5	25.0	10.0
Control	0	0.00	1	1228	8.3	0.5	10.0	10.0
Control	0	0.00	1	1236	8.7	0.5	32.0	10.0
PbAc	25	22.41	2	1208	19.8	0.5	25.0	31.0
PbAc	25	33.23	2	1213	27.9	2.05	23.0	28.0
PbAc	25	22.98	2	1215	30.5	2.3	28.0	53.0
PbAc	25	34.30	2	1217	14.4	0.5	10.0	18.0
PbAc	25	23.09	2	1248	25.6	1.15	21.0	2700 a
PbAc	75	69.36	3	1227	38.0	0.5	74.0	107.0
PbAc	75	80.22	3	1240	70.6	3.25	146.0	145.0
PbAc	75	80.12	3	1243	55.1	5	95.0	117.0
PbAc	75	72.73	3	1244	53.8	5.25	119.0	115.0
PbAc	75	86.17	3	1255	65.2	3.55	103.0	122.0
PbAc	225	261.26	4	1222	110.4	9.3	293.0	201.0
PbAc	225	271.00	4	1225	109.2	9.1	227.0	249.0
PbAc	225	254.18	4	1226	103.8	12.05	360.0	317.0
PbAc	225	215.60	4	1241	127.9	4.35	228.0	264.0
PbAc	225	193.84	4	1249	109.4	3.75	606.0 b	333.0 b
Oregon Gulch	225	235.95	11	1204	15.5	1.1	26.0	20.0
Oregon Gulch	225	225.51	11	1224	23.0	0.5	22.0	10.0
Oregon Gulch	225	224.39	11	1238	25.3	0.5	51.0	43.0
Oregon Gulch	225	244.29	11	1242	11.7	0.5	10.0	10.0

a *a priori* outlier determinations
b Outside 95% Prediction Intervals

TABLE C-9 Best Curve Fit Parameters

BLOOD	
PbAc Curve -	Exp
a	6.8
b	
c	129
d	0.0066
R2	0.949

BONE	
PbAc Curve -	Linear
a	0.62
b	0.0312
c	
d	
R2	0.774

LIVER	
PbAc Curve -	Linear
a	14.7
b	1.049
c	
d	
R2	0.903

KIDNEY	
PbAc Curve -	Linear
a	10.4
b	1.021
c	
d	
R2	0.889

Equations Used	
EXP	Y=a+c*(1-exp(-d*dose))
LIN	Y=a+b*dose

TABLE C-10 Relative Bioavailability of Lead in Test Material

Endpoint	Test Material Oregon Gulch
Blood	0.06
Kidney	0.04
Liver	0.05
Bone	0.004

Definitions

Plausible Range:	RBA(Blood) to mean RBA for Tissues
Preferred Range:	RBA(Blood) to (RBA(Blood) + RBA(Tissues))/2
Suggested Point Est:	1/2(RBA(Blood) + (RBA(Blood)+RBA(Tissues))/2)

Relative Bioavailability

	Oregon Gulch	
Plausible Range	0.06	0.03
Preferred Range	0.06	0.05
Point Estimate	0.06	

Absolute Bioavailability

	Oregon Gulch	
Plausible Range	3%	2%
Preferred Range	3%	2%
Point Estimate	3%	

TABLE C-11 INTRALABORATORY DUPLICATES

RPD = Relative Percent Difference
RPD = 100*[Orig-Dup]/((Orig+Dup)/2

* Non detects evaluated at 1/2 DL

Pig Number	group	material administered	dosage	day	matrix	Duplicate Value*	Original Value*	Average	RPD	Avg RPD	
1243	3	PbAc	75	-4	BLOOD	0.5	0.5	0.5	0%		
1251	5	Galena	75	-4	BLOOD	0.5	0.5	0.5	0%		
1209	6	Galena	225	-4	BLOOD	0.5	0.5	0.5	0%		
1236	1	Control	0	0	BLOOD	0.5	0.5	0.5	0%		
1208	2	PbAc	25	0	BLOOD	0.5	0.5	0.5	0%		
1217	2	PbAc	25	0	BLOOD	0.5	0.5	0.5	0%		
1222	4	PbAc	225	1	BLOOD	3.1	1.9	2.5	-48%		
1203	6	Galena	225	1	BLOOD	0.5	0.5	0.5	0%		
1252	8	Palmerton Loc2	25	1	BLOOD	0.5	0.5	0.5	0%		
1212	9	Palmerton Loc2	75	2	BLOOD	0.5	0.5	0.5	0%		
1221	10	Palmerton Loc2	225	2	BLOOD	4.2	4	4.1	-5%		
1246	10	Palmerton Loc2	225	2	BLOOD	3.3	2.2	2.75	-40%		
1233	5	Galena	75	3	BLOOD	0.5	0.5	0.5	0%		
1216	10	Palmerton Loc2	225	3	BLOOD	6.9	5.8	6.35	-17%		
1242	11	Oregon Gulch	225	3	BLOOD	0.5	0.5	0.5	0%		
1226	4	PbAc	225	5	BLOOD	5.2	6.2	5.7	18%		
1247	6	Galena	225	5	BLOOD	0.5	0.5	0.5	0%		
1229	7	Galena	675	5	BLOOD	0.5	0.5	0.5	0%		
1236	1	Control	0	7	BLOOD	0.5	1.1	0.8	75%		
1215	2	PbAc	25	7	BLOOD	2.6	2.7	2.65	4%		
1250	5	Galena	75	7	BLOOD	0.5	1.1	0.8	75%		
1241	4	PbAc	225	9	BLOOD	10	9	9.5	-11%		
1233	5	Galena	75	9	BLOOD	0.5	0.5	0.5	0%		
1203	6	Galena	225	9	BLOOD	0.5	0.5	0.5	0%		
1236	1	Control	0	12	BLOOD	0.5	0.5	0.5	0%		
1225	4	PbAc	225	12	BLOOD	8.7	10.4	9.55	18%		
1221	10	Palmerton Loc2	225	12	BLOOD	7.6	6.6	7.1	-14%		
1241	4	PbAc	225	15	BLOOD	10.8	9.4	10.1	-14%		
1204	11	Oregon Gulch	225	15	BLOOD	1.8	0.5	1.15	-113%		
1224	11	Oregon Gulch	225	15	BLOOD	2.3	1.9	2.1	-19%	-7%	BLOOD
1241	4	PbAc	225	15	FEMUR	15.05	4.35	9.7	-110%		
1239	10	Palmerton Loc2	225	15	FEMUR	6.65	5.8	6.225	-14%		
1204	11	Oregon Gulch	225	15	FEMUR	1.4	1.1	1.25	-24%	-49%	FEMUR
1227	3	PbAc	75	15	KIDNEY	93	107	100	14%		
1235	7	Galena	675	15	KIDNEY	10	20	15	67%		
1246	10	Palmerton Loc2	225	15	KIDNEY	170	225	197.5	28%	36%	KIDNEY
1251	5	Galena	75	15	LIVER	10	10	10	0%		
1207	8	Palmerton Loc2	25	15	LIVER	27	28	27.5	4%	2%	LIVER

TABLE C-12 CDC STANDARDS

Sample ID	Day	Q	Measured* Low Std	Med Std	High Std	Nominal Low Std	Med Std	High Std
12.1	-4	<	1			1.7	4.8	14.9
12.1	0		1			1.7	4.8	14.9
12.1	1	<	1			1.7	4.8	14.9
12.1	3		1.8			1.7	4.8	14.9
12.1	5		1.6			1.7	4.8	14.9
12.1	12		1.7			1.7	4.8	14.9
12.2	-4			4.6		1.7	4.8	14.9
12.2	1			4.8		1.7	4.8	14.9
12.2	2			3.9		1.7	4.8	14.9
12.2	3			4.9		1.7	4.8	14.9
12.2	7			4.4		1.7	4.8	14.9
12.2	9			5.3		1.7	4.8	14.9
12.2	15			4		1.7	4.8	14.9
12.3	0				16.5	1.7	4.8	14.9
12.3	2				16.3	1.7	4.8	14.9
12.3	5				15.1	1.7	4.8	14.9
12.3	7				15.4	1.7	4.8	14.9
12.3	9				17.4	1.7	4.8	14.9
12.3	12				11.4	1.7	4.8	14.9
12.3	15				16.1	1.7	4.8	14.9
Averages			1.35	4.56	15.46			
	Mean ratios		0.79	0.95	1.04			

* Non-detects evaluated at the detection limit

TABLE C-13 INTERLABORATORY COMPARISON

Tag Number	Pig Number	Group	Material Administered	Dosage	Qualifier			Result			
					CDC	EPA		CDC	EPA	Average	RPD
8-912-0120	1204	11	Oregon Gulch	225	<	<		0.6	1	0.8	50
8-912-0121	1207	8	Palmerton Loc 2	25	<	<		0.6	1	0.8	50
8-912-0122	1225	4	PbAc	225	<	<		0.6	1	0.8	50
8-912-0177	1253	5	Galena	75	<	<		0.6	1	0.8	50
8-912-0178	1232	9	Palmerton Loc 2	75	<	<		0.6	1	0.8	50
8-912-0179	21217	2	PbAc	25	<	<		0.6	1	0.8	50
8-912-0234	1210	9	Palmerton Loc 2	75	<	<		0.6	1	0.8	50
8-912-0235	1229	7	Galena	675	<	<		0.6	1	0.8	50
8-912-0236	1238	11	Oregon Gulch	225	<	<		0.6	1	0.8	50
8-912-0291	1245	8	Palmerton Loc 2	25	<	<		0.6	1	0.8	50
8-912-0292	1204	11	Oregon Gulch	225	<	<		0.6	1	0.8	50
8-912-0293	1221	10	Palmerton Loc 2	225				2.4	4	3.2	50
8-912-0348	1241	4	PbAc	225				8.2	7.8	8	-5
8-912-0349	1213	2	PbAc	25				1	2.4	1.7	82
8-912-0350	12.1	--	--	--	<			0.6	1.8	1.2	100
8-912-0405	1238	11	Oregon Gulch	225	<			0.6	1.6	1.1	91
8-912-0406	1240	3	PbAc	75				4.3	4.9	4.6	13
8-912-0407	1255	3	PbAc	75				3.5	4.9	4.2	33
8-912-0462	1251	5	Galena	75	<	<		0.6	1	0.8	50
8-912-0463	1223	8	Palmerton Loc 2	25	<	<		0.6	1	0.8	50
8-912-0464	1238	11	Oregon Gulch	225	<			0.6	1.6	1.1	91
8-912-0519	1204	11	Oregon Gulch	225	<			0.6	1.3	0.95	74
8-912-0520	1226	4	PbAc	225				7.9	9.1	8.5	14
8-912-0521	1242	11	Oregon Gulch	225	<			0.6	1.3	0.95	74
8-912-0576	21236	1	Control	0	<	<		0.6	1	0.8	50
8-912-0577	1203	6	Galena	225	<			0.6	1.2	0.9	67
8-912-0578	1225	4	PbAc	225				9.3	10.4	9.85	11
8-912-0633	1241	4	PbAc	225				9.8	9.4	9.6	-4
8-912-0634	1225	4	PbAc	225				8	8.4	8.2	5
8-912-0635	1247	6	Galena	225	<	<		0.6	1	0.8	50

FIGURE C-1 PbAc Groups by Day
Raw Data

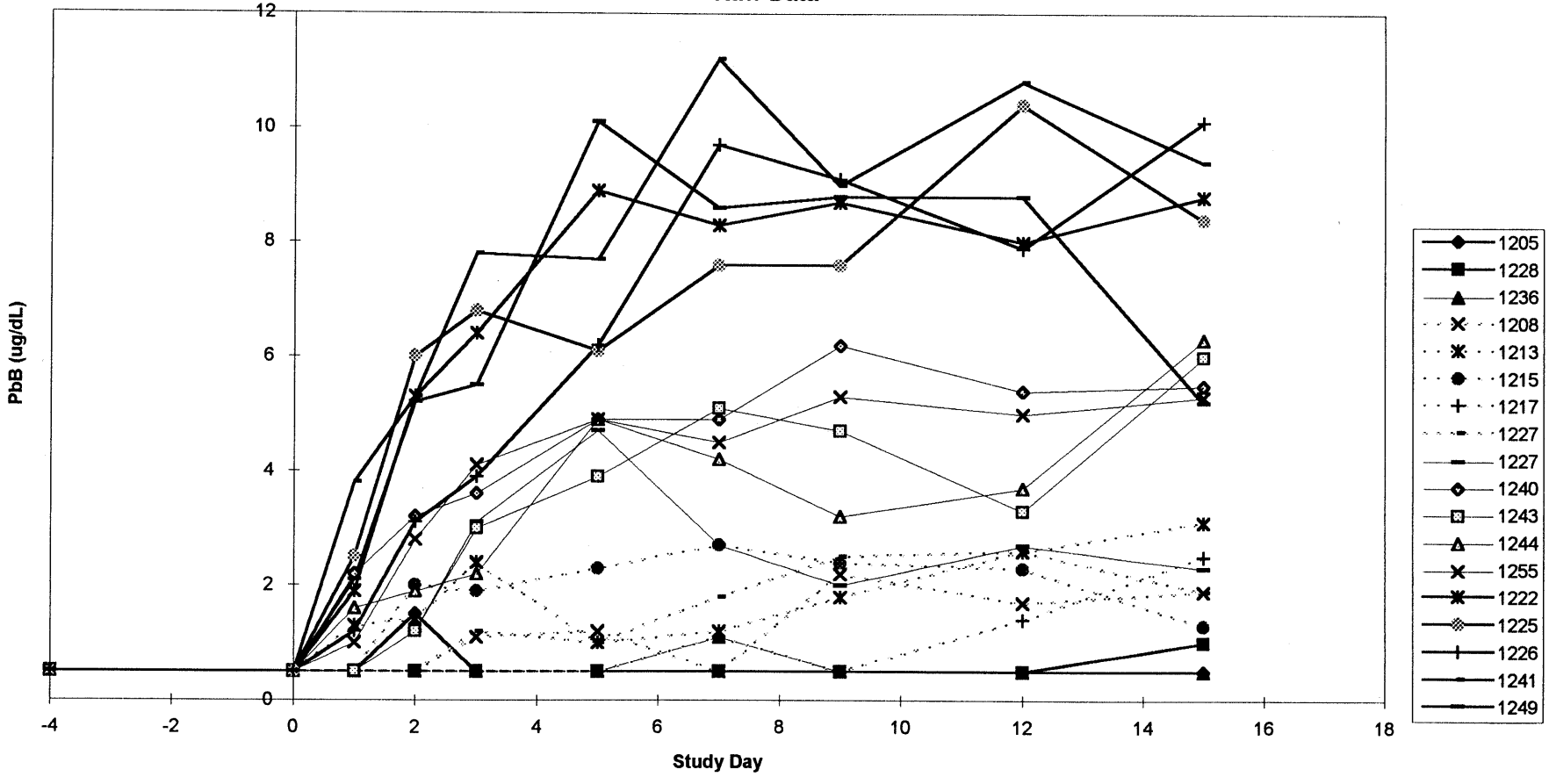


FIGURE C-2 Oregon Gulch Groups
Raw Data

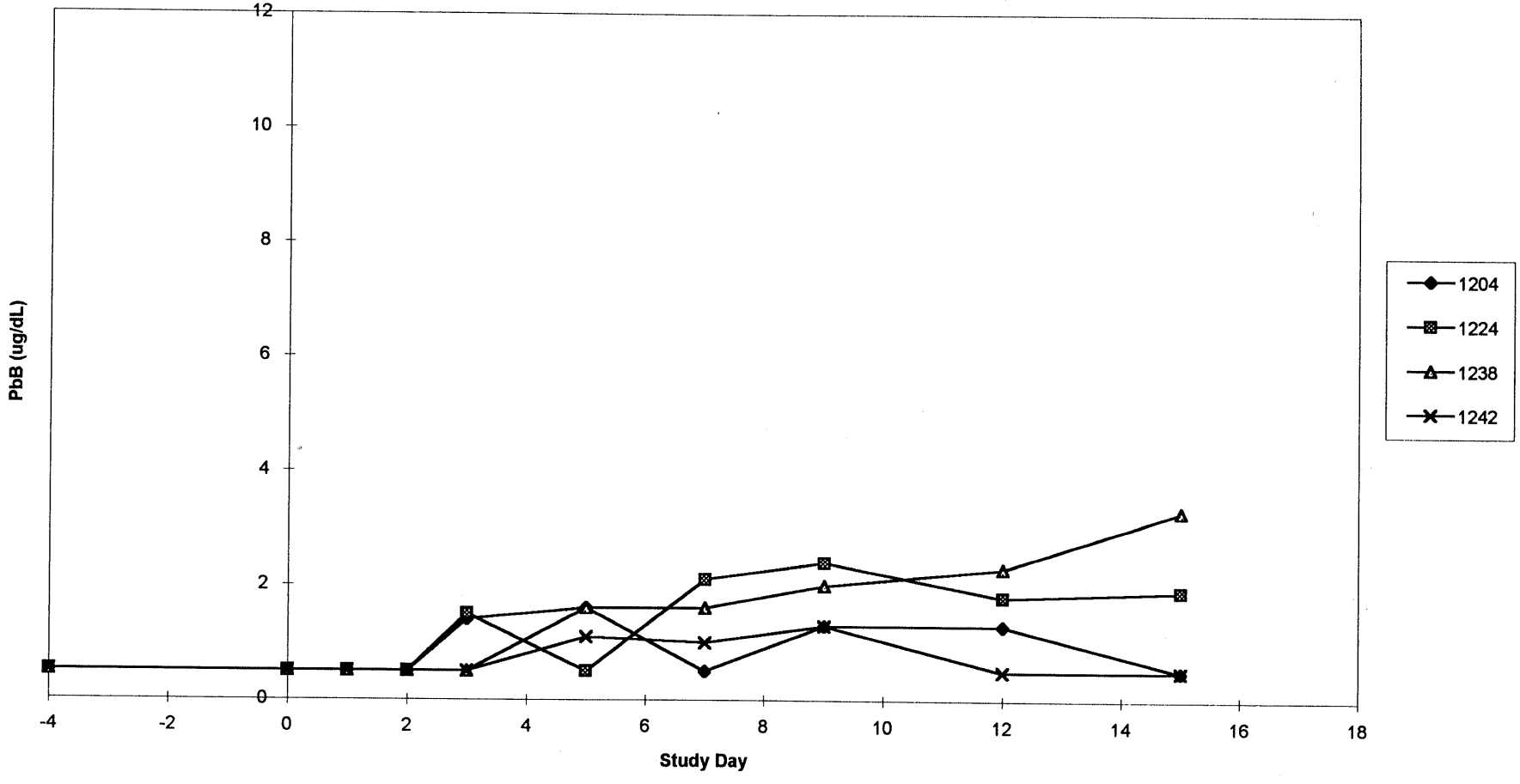


FIGURE C-3

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FIGURE C-4 Group Mean PbB By Day
Raw Data

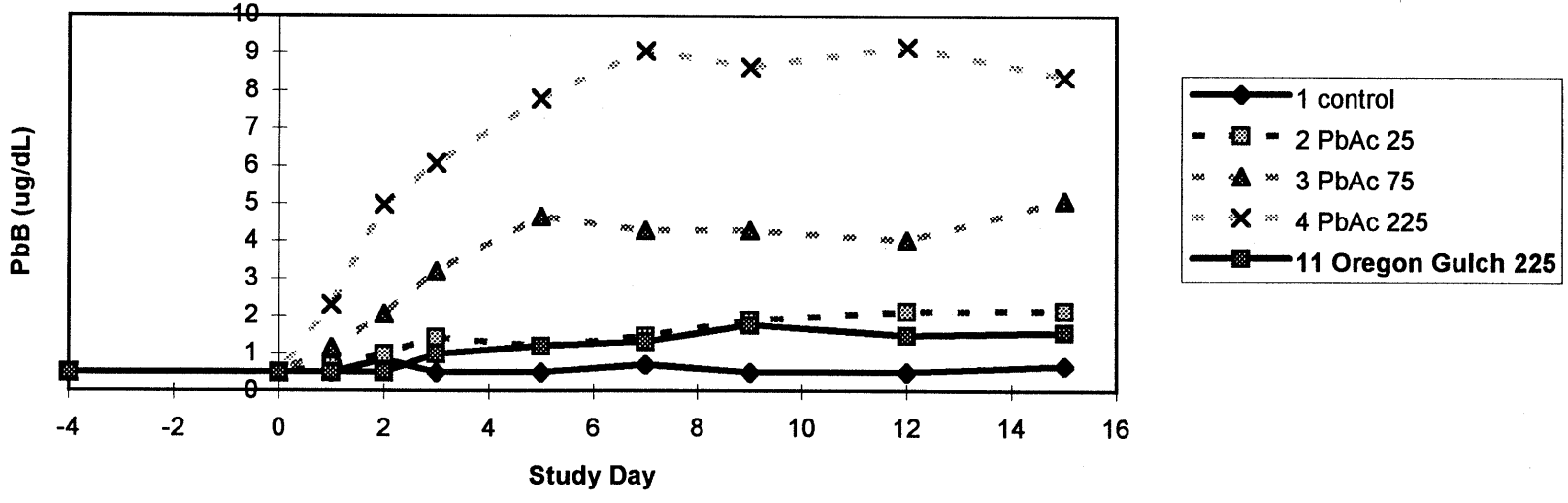
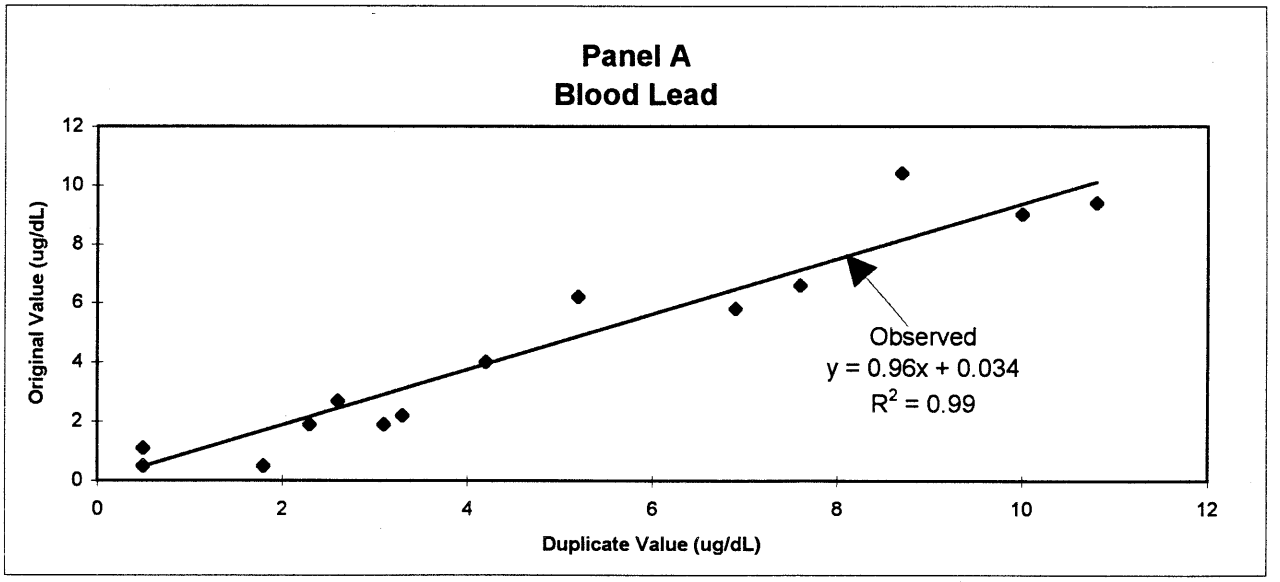
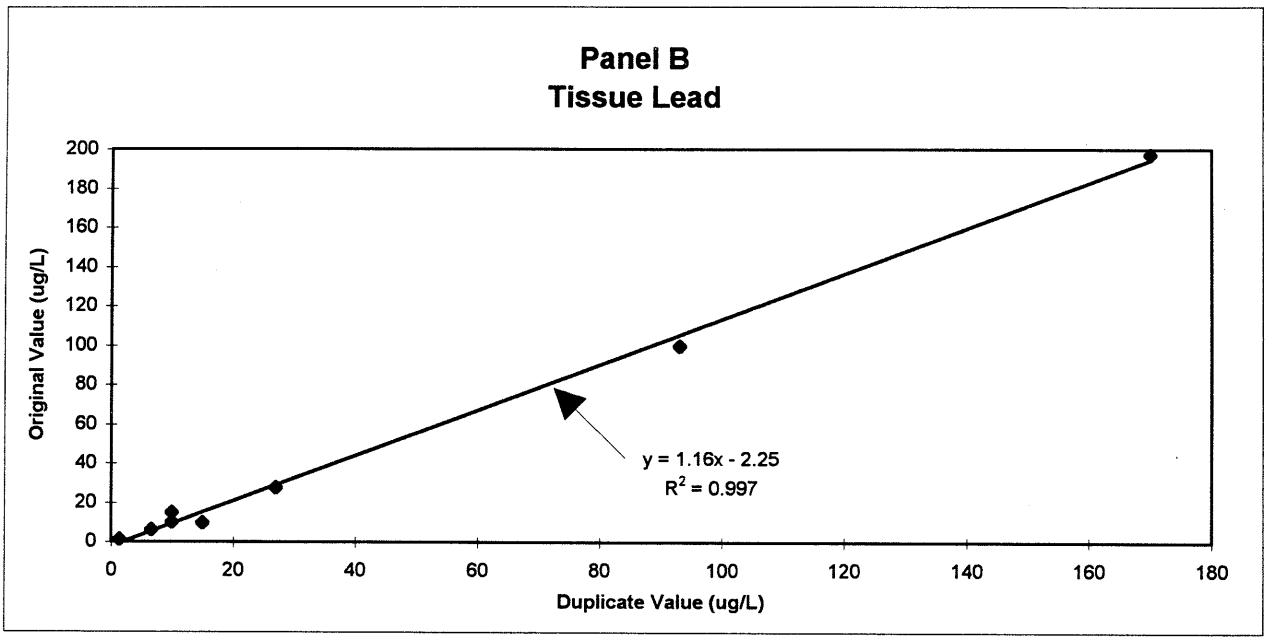


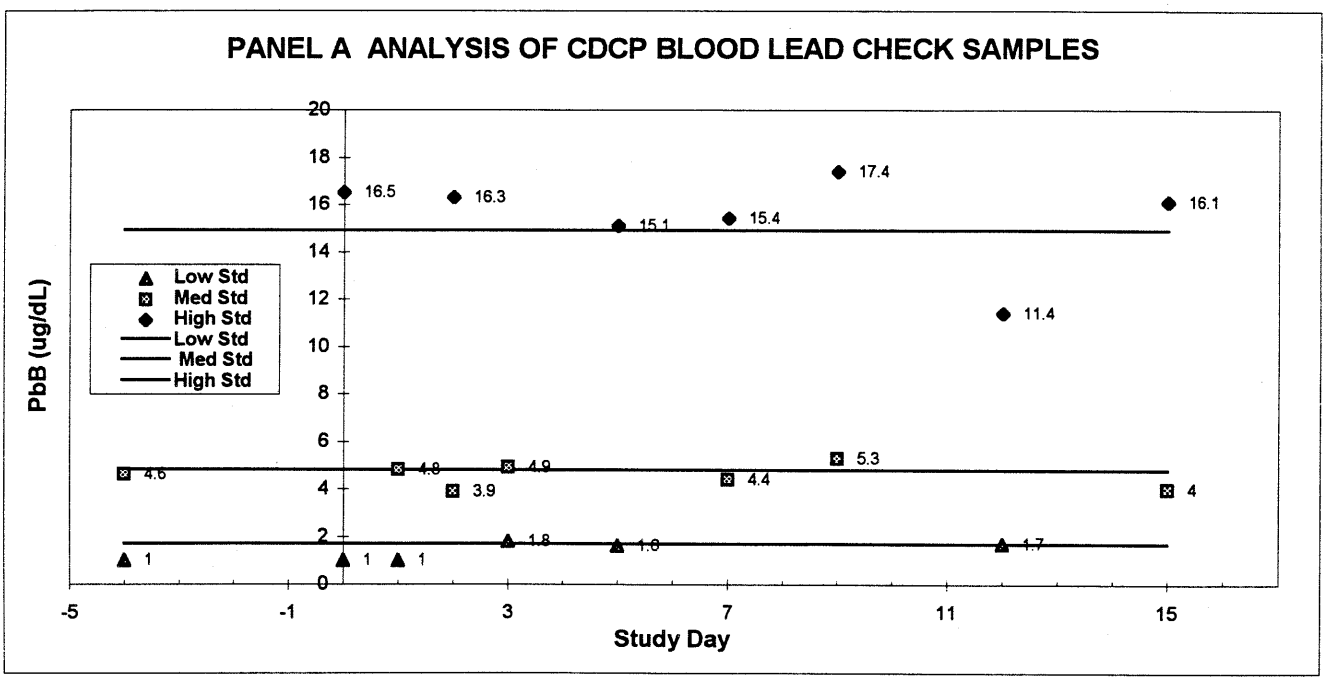
FIGURE C-5 COMPARISION OF DUPLICATE ANALYSES PHASE II EXPERIMENT 12





Blind random duplicates submitted at a 5% rate to EPA laboratories to provide a measure of analytical precision (reproducibility)

FIGURE C-6 CDCP CHECK SAMPLES
PHASE II EXPERIMENT 12



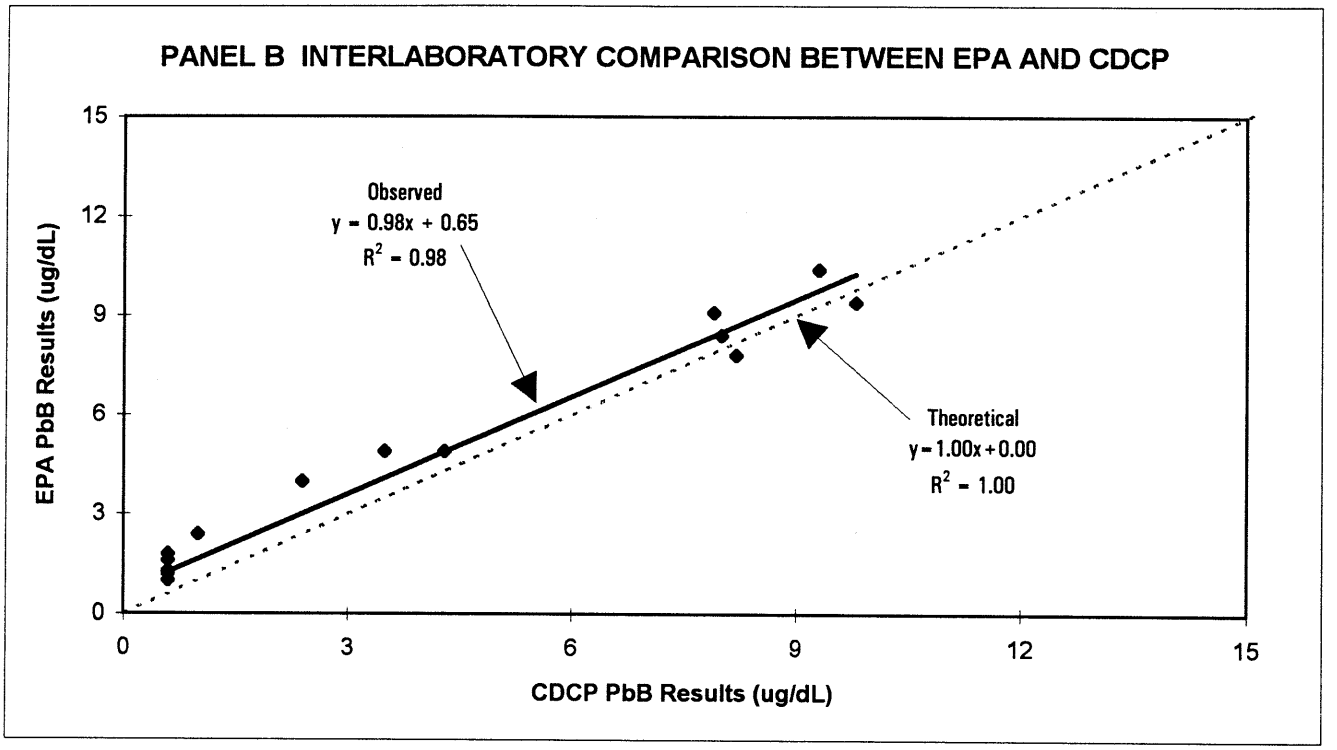
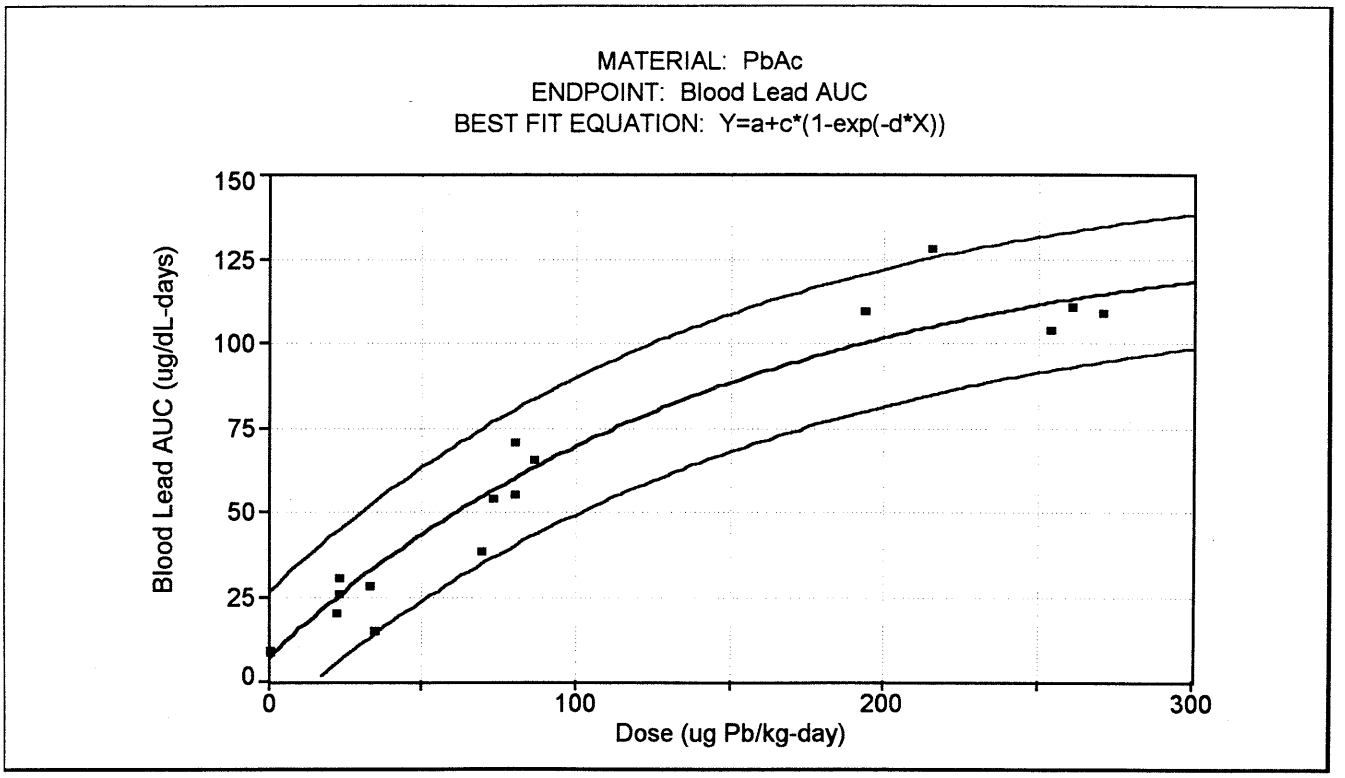


FIGURE C-7 BEST FIT CURVE WITH 95% PREDICTION INTERVALS*

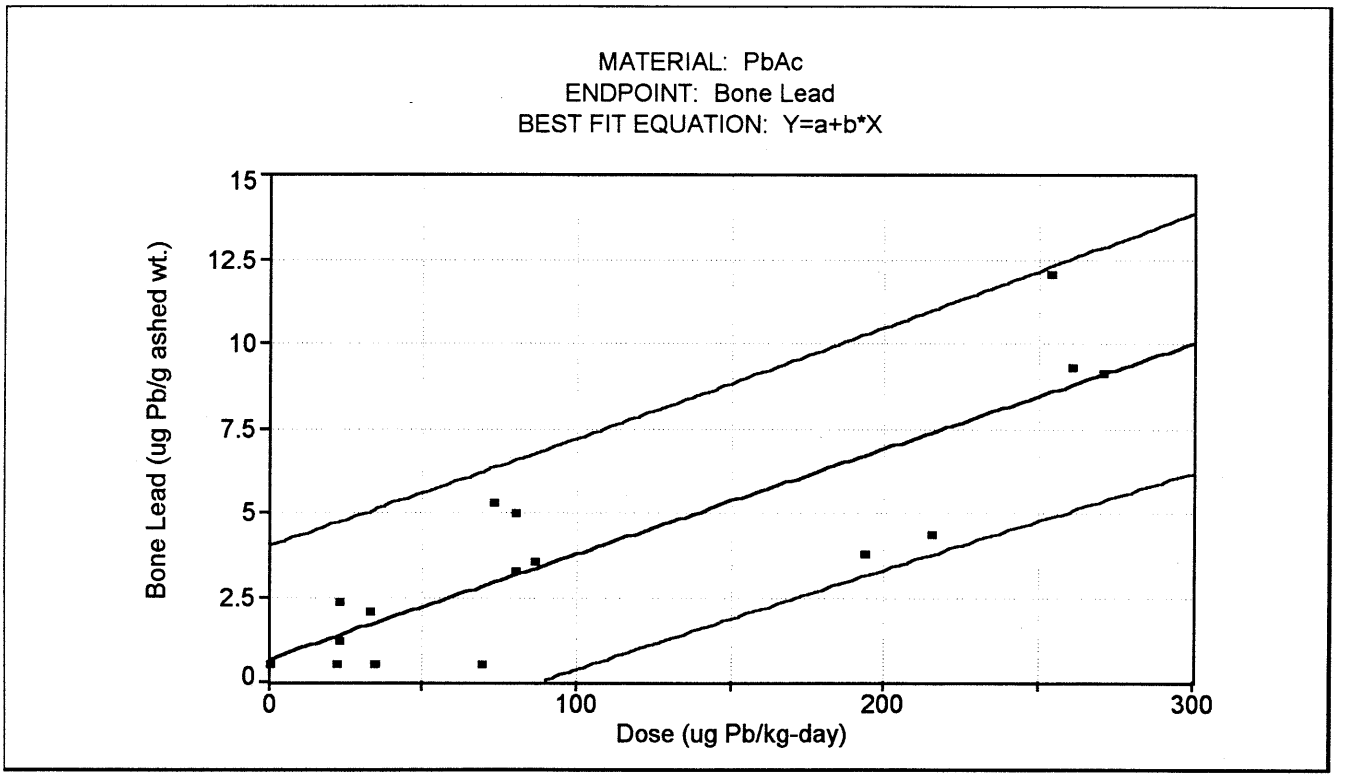


Parameters	Value	Std. Error	95% Confidence Limits	
a	6.8	fixed value	--	--
c	129	fixed value	--	--
d	0.0066	0.0005	0.0056	0.0076

Adj R^2	0.949

Generated using Table Curve 2D v. 3.0. Outliers represented by "+".

FIGURE C-8 BEST FIT CURVE WITH 95% PREDICTION INTERVALS*

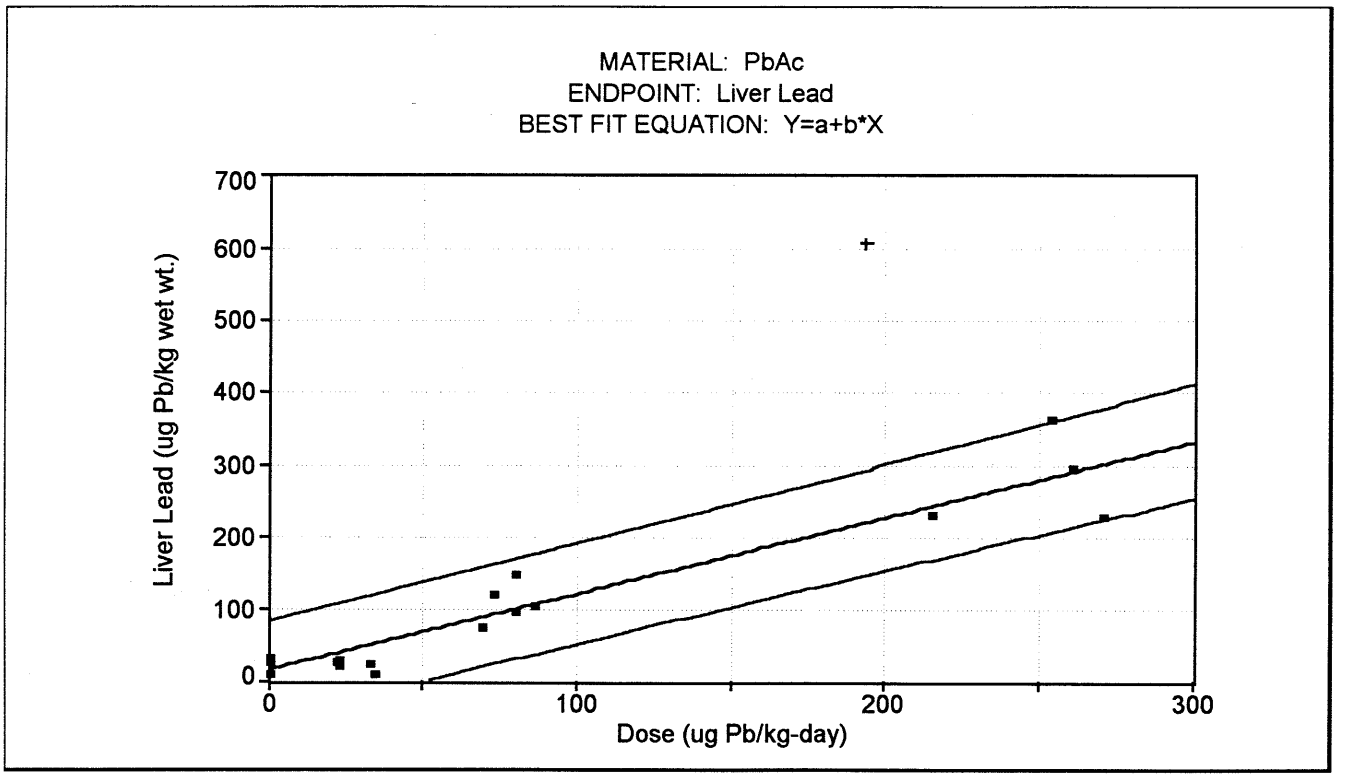


Parameters	Value	Std. Error	95% Confidence Limits	
a	0.62	fixed value	--	--
b	0.031	0.0029	0.025	0.037

Adj R^2	0.774

Generated using Table Curve 2D v. 3.0. Outliers represented by "+".

FIGURE C-9 BEST FIT CURVE WITH 95% PREDICTION INTERVALS*

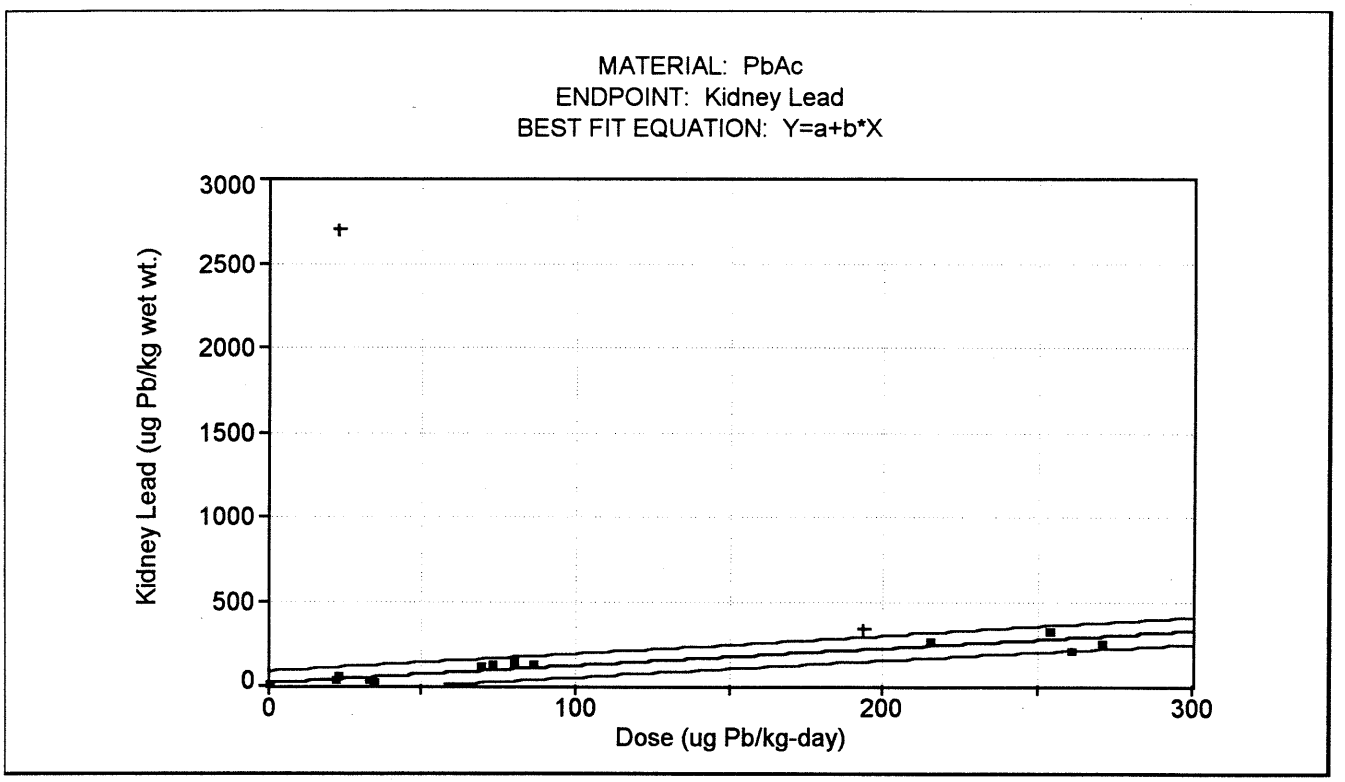


Parameters	Value	Std. Error	95% Confidence Limits	
a	14.7	fixed value	--	--
b	1.049	0.063	0.914	1.183

Adj R^2	0.903

Generated using Table Curve 2D v. 3.0. Outliers represented by "+".

FIGURE C-10 BEST FIT CURVE WITH 95% PREDICTION INTERVALS*



Parameters	Value	Std. Error	95% Confidence Limits	
a	10.4	fixed value	--	--
b	1.021	0.064	0.886	1.157

Adj R^2	0.889

Generated using Table Curve 2D v. 3.0. Outliers represented by "+".