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IN THE UNITED STATES DISTRICT COURT
FOR THE CENTRAL DISTRICT OF CALIFORNIA

STATE OF CALIFORNIA, on behalf of the CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL, Plaintiff, vs. UNITED STATES OF AMERICA, DEPARTMENT OF THE ARMY, and DOES 1 - 100, inclusive. Defendants.	No. CV 96-5205MRP(VAPx) No. CV 96-8867MRP(VAPx) (Consolidated) APPENDIX OF EXHIBITS IN SUPPORT OF UNITED STATES MOTION FOR SUMMARY JUDGMENT ON THE FIRST CAUSE OF ACTION AND PART OF THE THIRD CAUSE OF ACTION OF THE CITY'S COMPLAINT VOLUME 4 OF 6
CITY OF SAN BERNARDINO MUNICIPAL WATER DEPARTMENT, Plaintiff, vs. UNITED STATES OF AMERICA, DEPARTMENT OF THE ARMY, and DOES 1 - 100, inclusive. Defendants.	Date: February 21, 2000 Time: 10:00 a.m. Room: Courtroom 12 Judge: Mariana R. Pfaelzer

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Principal Types of Protective Coatings

A short course in practical paint technology to assist consulting and maintenance engineers

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KOPPERS
Chemicals and Coatings

DEPARTMENT OF HEALTH SERVICES
OCT 14 1982
SAN BERNARDINO

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If for instance the mil thickness should be 2 the coverage will be cut in half; if 3 the coverage will be cut to 1/3, etc.

Question: how many square feet will one gallon of paint with a nonvolatile volume of 35% cover to get 4 mils?

Answer: multiply magic number 16 by the percentage figure 35 and divide by 4.

$$\frac{16 \times 35}{4} = 140 \text{ square feet.}$$

These computations cannot give an answer to the question: How many coats have to be applied to get a certain mil thickness? This is controlled by the characteristics of the paint itself. If a coating should sag when applied at more than one mil thickness, you need 4 coats to get 4 mils. If a coating should sag when applied at more than 2 mil thickness, you would need 2 coats to get 4 mils and so on.

Most manufacturers of protective coatings state the coverage per gallon based on the area one gallon of paint can cover without running or sagging.

There are two questions which a painting contractor has to answer before he can profitably bid on a job where a coating he has never used before is specified.

Question 1: How many gallons do I need to cover a certain area with a specified mil thickness?

Question 2: How many coats do I need to get the specified mil thickness?

If the paint manufacturer furnishes the coverage and the nonvolatile volume percentage, anyone can do his own figuring with the help of the magic number 16.

Example: The area to be covered is 10,000 square feet and the specified mil thickness is 4. The paint specified covers 280 square feet per gallon and the nonvolatile volume is 35%.

Answer to question 1: Multiply 16 by the percentage figure 35 and divide by the specified mil thickness of 4, which gives you the square feet one gallon of this paint will cover 4 mils thick.

$$\frac{16 \times 35}{4} = 140 \text{ square feet.}$$

If one gallon covers 140 square feet 4 mils thick, you need for 10,000 square feet 10,000 divided by 140.

$$\frac{10{,}000}{140} = 71.5 \text{ gallons.}$$

The answer to question 1 is: 71.5 gallons.

Answer to question 2: We have now determined the number of gallons required to get 4 mils on 10,000 square feet, using a coverage of 140 square feet per gallon. However, the stated coverage is 280 square feet, which means the paint will sag if the application is attempted at 140 square feet. The only thing that has to be determined is: how many coats at the *stated* coverage are required to produce 4 mils? Simply divide the *necessary* coverage (140) into the stated coverage (280) and you get: 2 coats. Each coat will be 2 mils (4 mils ÷ 2 coats = 2 mils per coat). If the stated coverage was 420 square feet, three coats would be required (420 ÷ 140 = 3), and each coat would be 1-1/3 mils (4 mils ÷ 3 coats = 1-1/3).

The manufacturer can give only the theoretical coverage on flat smooth surfaces. The actual coverage is much less than the theoretical value because of surface irregularities and unavoidable loss of material during application. Average loss is 10 to 20%, which will be even higher on heavily pitted steel, rough concrete and in spray painting of large objects on windy days.

In applying heavy high build coatings it is necessary for the applicator to measure the wet film thickness frequently with a wet mil thickness gauge during application. In this way he is sure, not only that the right amount of paint for the specified mil thickness is applied, but also that not too much material is used, which will lead to excessive mil thickness, material wasted and increased cost.

It is difficult to measure the wet mil thickness of a thin fast drying coating, because the solvent evaporates too fast for correct measuring. Heavy coatings do not dry as fast and their evaporation rate is not as critical. It is very easy to convert wet film thickness into dry mil thickness, if the nonvolatile volume is known. If the wet mil thickness is 10 mils and the nonvolatile volume is 30% you multiply 10 mils by the percentage figure of 30 and divide by 100 to get the dry mil thickness of 3 mils. The other way around, if you want to know what the wet mil thickness has to be, if the desired dry mil thickness is 3 mils, and the nonvolatile volume of the paint is 30%, you multiply the desired dry mil thickness by 100 and divide by the percentage figure of 30. The answer is 10 mils wet.

The nonvolatile volume of a paint given by the manufacturer in his literature refers to the paint as furnished. It is often overlooked that thinning will change the nonvolatile volume proportionally to the amount of thinner added.

If for instance the stated nonvolatile volume is 35%, the nonvolatile volume after thinning with 10% solvent will be only 31.8%. This does not matter as long as the thinning is not done to stretch the coverage of the paint which will lower the specified mil thickness.

Thinning and the corresponding lowering of the nonvolatile volume has, however, to be considered if the wet mil thickness of a heavy coating is measured during application. If a heavy paint like coal tar epoxy with a nonvolatile volume of 73% is applied undiluted and the desired mil thickness is 8 mils, the wet mil thickness during application will be, according to the formula given previously,

$$\frac{8 \times 100}{73} = \text{approximately 11 mils.}$$

Thinning with 10% solvent will reduce the nonvolatile volume by approximately 10% to 65.7%. Now the wet mil thickness will be

$$\frac{8 \times 100}{65.7} = \text{approximately 12.2 mils.}$$

One can readily see this will make quite a difference.

It is not possible even for the best applicator to hit the mil thickness right on the nose and he should be given a reasonable leaveway. The unavoidable error, however, should be on the high side because most specifications call for a minimum mil thickness. Wet Paint Thickness Gauges are commercially available and are easy to use.

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We do not believe, high mil thickness should be obtained with solvent type coatings in one or two coats, by making the paint thixotropic and therefore nonsagging at low square footage. This may result in a spongy and cracking film. Additional coats will reduce the possibility of having continuous passageways caused by air bubbles, especially in coatings with very fast evaporating solvents. A slower evaporating solvent will reduce these air bubbles markedly. If thinner coats are applied and more of them, the chances of getting a pore-free film are very good, because each coat will close the pores of the previous one.

Even in solvent-free epoxy coatings, which of course can be applied in a very heavy film thickness in one coat, it has often been observed, that the adhesion suffers badly, if they are applied above 2 mils in one single coat. Any cutting or break-thru by mechanical means may cause peeling away from the substrate.

Mild atmospheric conditions call for a thickness of at least 3-1/2 mils. In industrial environments, where the conditions are more severe 5 mils are recommended. Submerged surfaces need a thickness of 5 to 15 mils, depending on the corrosiveness of the liquid and the coating system used. Heavy bituminous coatings are best applied in 18 to 20 mil thicknesses and in some instances as high as 1/32".

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'SMART MONEY' PAINTING

By SOL T. SPRAYER

Cost of the paint itself is far from the determining factor in the cost of maintenance painting

According to reliable estimates, industrial paint sales in the United States, as opposed to so-called "trade sales," amounted to approximately $800 million in 1962.

Although exact breakdowns are not available, it may be safely assumed that anti-corrosion maintenance paint represented a significant portion of the industrial sales total.

But the paint is only part of the cost of the never-ending battle against industrial corrosion. One must multiply the cost of that paint six times to account for the all-important factors of surface preparation, application labor, preventive maintenance and laboratory testing.

It is obvious, then, that industrial painting provides marked economic incentive from at least two points of view. The first, of course, is the incentive to protect the industrial installation from deterioration. The second involves making sure that funds budgeted to achieve this protection are spent wisely and effectively. It is with this latter area that this study will be concerned.

The chemical industry alone is said to spend more than $600 million a year to fight plant and equipment deterioration resulting from corrosion. On the average, annual painting costs for a chemical plant are said to approximate 0.5 per cent of the capital investment.

Thus, the annual cost of painting a $10 million plant is calculated at around $50,000 per year.

It is interesting to note that the relationship of cost of maintenance painting to capital investment varies with the industry involved. In the heavy chemicals industry, as already noted, the average cost of painting is 0.5 per cent of the capital investment. In the plastics industry it is somewhat lower, 0.42 per cent. The pharmaceutical industry spends the same amount as the plastics industry, whereas the metallurgical industry spends the very low figure of 0.21 per cent.

On the other hand, plants manufacturing organic intermediates spend 0.77 per cent per year of their capital investment for painting, whereas the corresponding figure for the petro-chemical industry is 0.62 per cent.

Obviously, in expenditures of this magnitude, there may be room for increased effectiveness. But the point must be stressed that this effectiveness can result only from a firm understanding of all the factors involved in achieving the end result.

One factor, frequently given far too much emphasis, is the cost of the paint. One of the objectives here is to show that the cost of the paint is a relatively minor factor in comparison with surface preparation and applications cost, preventive maintenance costs and evaluation expense in the overall economics of a maintenance painting program.

Evaluation and Testing:

Basic to any effective maintenance painting program is evaluation and testing. The industrial maintenance paint specialist either must carry out his own testing program or he must have access to the results of such a program undertaken either by material suppliers, paint manufacturers or painting contractors.

In an evaluations program, an entire system must be evaluated rather than a given paint. This means that the panels must be made from the same material as the substrate to be protected in the plant.

Panels of irregular shape should be used so that the performance of the system on flat surfaces, edges, angles, corners and pockets can be observed.

The surface of the panel must be prepared by the same procedures to be used on the actual plant surfaces, after which the panel must be coated with the primers and topcoats to be tested. Finally, these coated panels must be exposed in the atmosphere where the structures to be maintained are located.

Bear in mind that it is always easier to prepare a panel in the laboratory than it is to paint a large surface area in the field. Accordingly, the ease of application of the system may be a determining factor relative to its ultimate performance in the field.

Indeed, the objective of a testing program is not to test a primer and topcoat applied under optimum laboratory conditions, but rather to check out a system applied under conditions which duplicate field application as closely as possible.

Thus, basic to the economics of any industrial painting program is the testing program which precedes the choice of the system. The actual cost of this testing program may be relatively small in relation to the overall expenditures. But its importance is out of all proportion to its actual cost.

Only by means of such a program can judicious control be achieved over the other cost factors involved.

An evaluations and testing program is a continuing operation since literally thousands of combinations of primers, topcoats and surface preparations can be devised. Also, new raw materials continually are becoming available and must be tested.

In such a program the maintenance painting specialist's knowledge of the systems involved, as well as his

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experience, insight and intuition, are extremely important.

Factors in Maintenance Painting:

As has already been indicated, the important factors in maintenance painting are application costs, surface preparation costs, raw material costs and preventive maintenance costs. It is in these areas that a strong inter-relationship exists with technology and particularly with the testing program.

If surface preparation is poor or if the improper paint has been chosen, preventive maintenance costs may increase markedly. Obviously, then, any economies effected in the first two instances will be of little significance.

Correspondingly, poor labor practice will make ineffective the results of the surface preparation and the choice of an effective paint. An understanding of these interrelated variables is extremely important.

Martinson and Sisler *(Industrial Painting, the Engineered Approach)* point out that in 1960 the industrial average unit cost of painting was 47 cents.

This means that the cost of painting one square foot of steel, including proper surface preparation, cost of paint, and cost of application of a three-coat system to achieve a minimum dry film thickness of five mils, was approximately 47 cents. This may be accounted for as follows.

Surface preparation	**$0.21**
Application labor	**0.14**
Material	**0.08**
Miscellaneous (e.g. scaffolding and clean-up)	**0.04**
	$0.47

Additional insight into the cost of maintenance painting of chemical plants is provided by a survey conducted by Technical Unit Committee T-6D of the National Association of Corrosion Engineers.

The report summarizes the results of questionnaires circulated to 800 plants in a variety of chemical and metallurgical industries. From the survey it may be concluded that the annual outlay for maintenance painting is increasing.

Also of critical importance is the labor-to-material cost ratio of three to one. Furthermore, the cost of surface preparation is approximately the same as the cost of the application, according to the results of this study.

It is obvious from the above that the cost of paint itself is far from the determining factor in the cost of industrial painting.

Paint Costs:

Competent industrial paint specialists long ago have realized that the cost per gallon of paint is not an absolute measure of the amount of paint purchased. The effectiveness of the paint is, of course, a critical feature which must be determined by actual field testing as described above.

The point has been stressed many times that an alkyd paint, although cheap on a per gallon basis, may be completely useless in a corrosive atmosphere.

But over and above this factor is the interesting relationship which exists between per cent solids by volume and cost per gallon. Frequently the maintenance painting specialist is confronted with the task of deciding whether to purchase an epoxy paint from one supplier at eight dollars per gallon or from another at twelve dollars per gallon.

Solids content is frequently a determining factor and can be utilized to translate the cost per gallon to the cost per mil of paint applied per square foot.

The Dow Chemical Co. has provided a nomograph (pg. 8) which gives the answer to this question if the per cent solids by volume and the cost per gallon are known.

The nomograph is based on the assumption that a gallon of paint at a given solids content by volume will cover a predetermined number of square feet at a thickness of one mil.

On this basis, then, as can be seen by examining the Dow Nomograph, paint at 50 per cent solids, costing $8 per gallon, will cost $0.01 per mil per square foot.

If the cost is $12 per gallon and the solids content is 78 per cent, the cost of a one mil coating per square foot is approximately the same.

This nomograph is useful for comparing similar paints which are sold at different solids contents. But it can only be used if the solids contents are known by volume rather than by weight.

Accordingly, in choosing a paint, the maintenance painting specialist should know at least two things: First, how the paint will perform in a specific system which includes a specified primer and a given type of surface preparation; second, if he has a choice of the same paint from several suppliers, he can determine which is actually less expensive by the use of the Dow Nomograph.

An important factor in choosing a paint is to make sure that three coats will provide roughly five mils of film thickness. Less than five mils has been shown to provide inadequate protection. Whether greater thickness is required must be determined by the testing program involving actual exposure.

A general rule of thumb in maintenance painting is that the more exacting the surface preparation, the better the ultimate results. As reference to the previous cost breakdown will indicate, surface preparation is the major cost involved.

Martinson and Sisler provide the following average costs per square foot for these methods of surface work:

Sand blast to white metal	**$0.25**
Commercial sandblast	**0.13**
Power tool cleaning	**0.10**
Hand cleaning	**0.13**
Steam (or detergent) cleaning	**0.15**

Again, the importance of the paint testing program cannot be overemphasized. Obviously, the least expensive surface preparation consistent with desired overall results should be utilized. It is likewise apparent that,

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if sandblasting causes the system to last twice as long, it is inadvisable not to employ it.

Needless to say, this can be determined only by actual testing.

Recently, epoxy systems – particularly those based on the epoxy-polyamide vehicle – have become available. These, according to their suppliers, can be utilized with a minimum of surface preparation because of the surface active and corrosion inhibiting nature of the polyamide resins.

The maintenance painting specialist will want to investigate any system which offers promise of cutting the cost of the most expensive portion of his paint program – surface preparation.

Labor Costs:

Labor costs are estimated by Martinson and Sisler on the basis of cost per square foot per coat of conventional systems which build up to five mils in three coats as follows:

Brush labor	**$0.5–0.6**
Spray labor	**0.3–0.5**
Roller labor	**0.3–0.5**

Again it is obvious that judicious choice must be exercised in deciding which type of labor to use. Spray or roller labor is cheaper and faster; brushing makes for better penetration of the paint and better coverage of edges and corners as well as for better coverage of crevices. In some cases, more expensive brush labor may make possible less expensive surface preparation.

A Maintenance Program:

The importance of systematic procedures to maintain a paint film once it has been applied cannot be overemphasized. A program for touching-up coatings when corrosion patches appear can make a good paint system last for ten years, assuming that a paint has been chosen which is suitable for the environment in which it is being used.

A system with which touch-up will be used requires annual inspection and annual touch-up with one full coat applied during the fifth year in order to improve appearance.

A disadvantage of a touch-up system is that the newly painted areas never quite match the original color; particularly if chalking has taken place. Even so, the imperfect matching is more desirable than rust spots.

Some of the newer catalyzed epoxy coatings are said to chalk in such a way as to provide a uniform surface which can be repainted with a minimum of maintenance cost. Again the maintenance painting specialist will be well advised to investigate newer technology of this sort.

The NACE survey mentioned earlier indicated that industry tends to paint its installations every four years. This, of course, is far from the goal of a coating which lasts for 10 years with a one-coat renewal application at the end of five years and a touch-up program in the interim.

It emphasizes the point, however, that there is room for significant economies in a properly engineered maintenance painting program.

Complete insight can only be gained by an extensive test program in which actual exposure of numerous systems is carried out to determine which system – that is to say, which combination of surface preparation, number of coats, primer and topcoat – will provide the desired results at the minimum cost.

The maintenance painting specialist who undertakes such a program will recover the cost of his testing many times over. In addition, he will be able to achieve far more effectively his objective of combating the punishing effects of corrosion.

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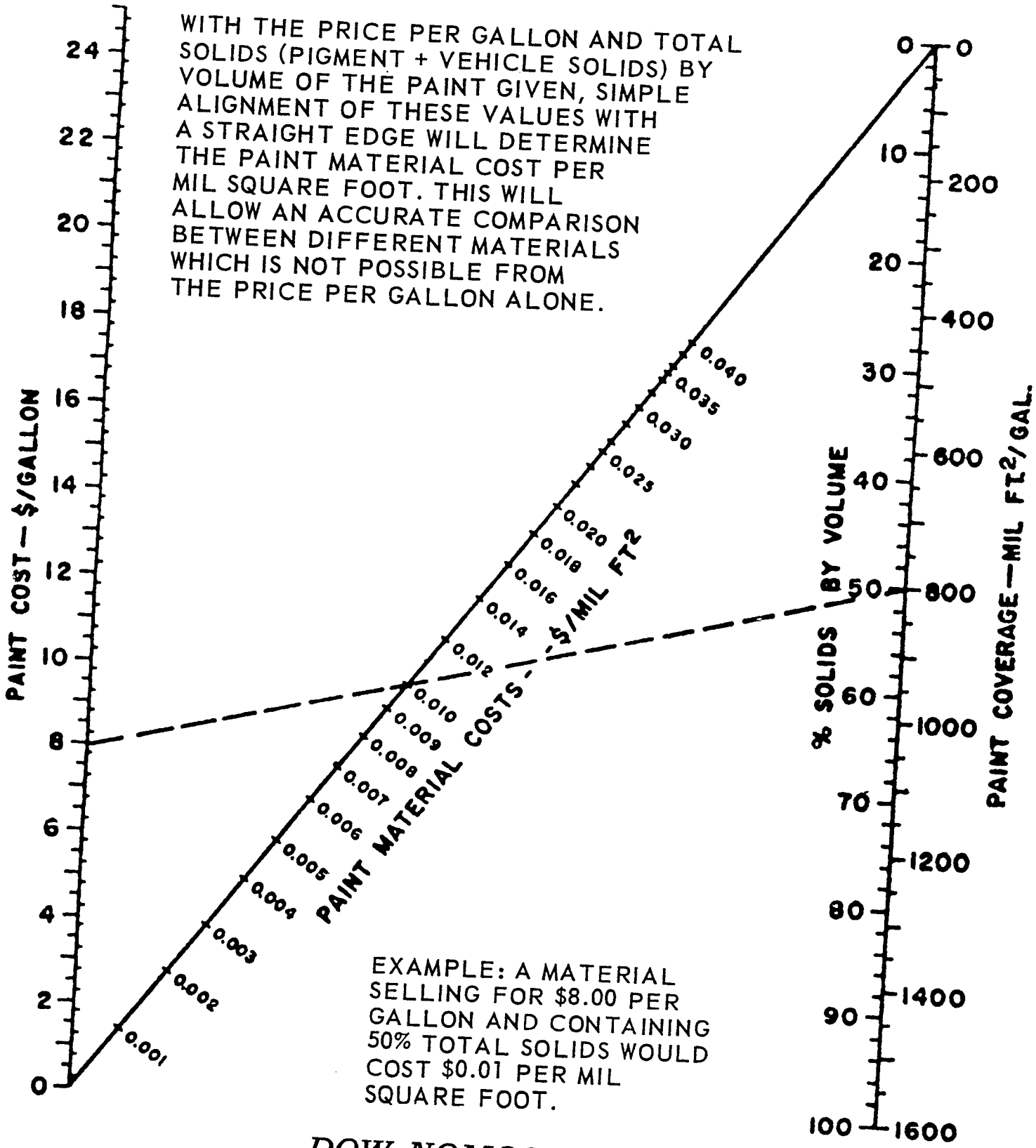
WITH THE PRICE PER GALLON AND TOTAL SOLIDS (PIGMENT + VEHICLE SOLIDS) BY VOLUME OF THE PAINT GIVEN, SIMPLE ALIGNMENT OF THESE VALUES WITH A STRAIGHT EDGE WILL DETERMINE THE PAINT MATERIAL COST PER MIL SQUARE FOOT. THIS WILL ALLOW AN ACCURATE COMPARISON BETWEEN DIFFERENT MATERIALS WHICH IS NOT POSSIBLE FROM THE PRICE PER GALLON ALONE.



EXAMPLE: A MATERIAL SELLING FOR $8.00 PER GALLON AND CONTAINING 50% TOTAL SOLIDS WOULD COST $0.01 PER MIL SQUARE FOOT.

DOW NOMOGRAPH

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VARIATIONS IN RESISTANCE OF PIGMENTS

Although the modern trend goes all out for color, one must keep in mind that not all colors which look beautiful on an interior decorator's color card, are suitable for industrial environment. As a matter of fact, prime pigments which fade only slightly under the actinic rays of the sun, and are at the same time not chemically attacked by sulfur and other industrial gases or the alkali in concrete, are rather limited in number. All pigments which are based on lead discolor badly when in contact with sulfur gases, such as sulfur dioxide and hydrogen sulphide. Examples are: red lead, white lead, chrome green, chrome yellow and chrome orange. Pigments based on aluminum; tinted aluminum; titanium dioxide; zinc oxide; yellow, brown and red iron oxides; chromium oxide; toluidine red and the phtalocyanine blues and greens are very stable, especially in solid colors. In pastel shades, however, they tend to bleach out under the sun, due to the chalking of the preponderant white pigment. For interior surfaces, these delicate pastel shades are entirely feasible, even under industrial conditions. Aluminum powder, which is considered one of the best and most stable outside pigments, will turn greyish in certain environments – for instance, near the seacoast.

THEORY OF CORROSION

Corrosion of metal is an electro-chemical phenomenon. The precise definition is ". . . the destruction of a metal by chemical or electro-chemical reaction with its environment." This change in metal is caused by contact with moisture, oxygen, and corrosion accelerators, such as sulphuric acid, hydrogen sulfide, carbonic acid, salts, soot, ashes and dust – always present in our age of heavy industrialization.

To explain in simple words, to the layman, the corrosion of metal according to the electro-chemical theory is rather difficult. The actual process is quite complicated, and for a full understanding, a knowledge of electro-chemistry is necessary. But to get a general idea of what occurs when metal corrodes, the following explanation may be helpful.

All metals in contact with water, acids or salt solutions have the tendency to go into solution as positively charged ions, leaving negative electrons behind. The force which drives the metal into solution (and which is different for each metal) is called electro-motive force or potential. Magnesium, for instance, has a very high potential; gold, a very low potential. The higher the electro-motive force, the greater the tendency of the metal to throw off positively charged ions. The lower the electro-motive force, that is, the more noble the metal is, the more reluctantly will ions be formed. To preserve electrical equilibrium for each positive ion going in solution, another positive ion already in solution must be displaced. To make it clearer, let us consider the following example:

Take a glass beaker and fill it with diluted sulphuric acid which in solution is separated into positively charged hydrogen ions and negatively charged SO_4 ions. Dip a strip of chemically pure zinc into this solution. The zinc will go into solution as positively charged ions, leaving negative electrons behind. The zinc ions will displace an equal number of positive hydrogen ions which will surround the zinc strip. The positive zinc ions will form zinc sulphate with the negative SO_4 ions. This action will soon cease, because the negative charges accumulating on the zinc, and the hydrogen plated on the metal, will prevent further formation of zinc ions. If, however, a strip of copper which has a much lower electro-motive force than zinc is also submerged in the solution, and a connection between zinc and copper is made with a wire, things begin to happen. The negative charges which had accumulated on the zinc metal and had stopped further action, flow from the zinc through the wire to the copper. At the same time, the displaced positive hydrogen ions will migrate towards the copper, combine with the negative electrons moving through the connecting wire to the copper, form gaseous hydrogen molecules and be discharged as gas bubbles. Now zinc can go into solution again and will continue to corrode till either the zinc strip has disappeared or the sulphuric acid has been used up. This is called a galvanic cell. An electric current is generated, because a continuous circuit has been established. Electrons left behind by the positive zinc ions, flow from the anode through the wire to the cathode, forming the external circuit and back through the electrolyte between cathode and anode completing the circuit.

All corrosion of metals, with the exception of direct chemical attack by strong acids or bases, are caused by the formation of local galvanic cells. To form a galvanic cell, three conditions must be fulfilled: there must be two electrodes, that is, two points of different electrical potential: the anode with a higher potential, and the cathode with a lower potential. There must be contact between the points of different potentials, and there must be an electrolyte present to complete the circuit. In addition, to keep corrosion going, the corrosion products must somehow be removed.

Let us see now how these principles explain the rusting of iron. Commercial iron is not homogeneous, but physically and chemically heterogeneous with numerous different potentials existing on the surface. Impurities in the metal, oxidation of the metal such as mill scale, strain on part of the metal, and many other reasons cause different potentials. These points with different potentials are in contact with each other. Electrolyte is furnished by water or moisture which will – in mild environments – contain carbonic acid and oxygen absorbed from the air, and in industrial localities or in salt-laden air, additional corrosion accelerators. All three conditions for forming a galvanic cell are fulfilled. Iron starts to go into solution at the anode as ferrous ions, and the displaced hydrogen will combine with oxygen at the cathode to form water. In acidic electrolytes, hydrogen will escape as gas. The ferrous ions presumably first form ferrous hydroxide, and are then oxidized (by the oxygen dissolved in the water) to ferric hydroxide, which is insoluble in water, and is called rust.

The electro-chemical theory is the only one which satisfactorily explains four well-known facts about corrosion and the formation of rust. These facts are:

1. *In dry air, with no moisture present, iron will form only a thin oxide layer on the surface but will not be further attacked.*
2. *Even in moist air, iron will not be attacked if no water actually condenses on its surface.*
3. *In chemically pure water, iron will not rust if not exposed to air, which furnishes the necessary oxygen.*
4. *Iron will rust before dew point is reached, if air-borne impurities settle on the iron, carrying moisture and corrosion accelerators with them.*

Iron rust is porous. Unlike aluminum, it does not form a closely adhering, impervious and, therefore, protective layer of oxides on the metal. Instead, the porosity of iron rust will permit further access of moisture and oxygen. Corrosion will go on.

Iron has a higher electric potential than mill scale, which is often expressed as: "iron is anodic to mill scale," or "mill scale is cathodic to iron." Both expressions mean the same thing. If the size of the cathode is much larger than the anode, for instance in the case of cracked mill scale, the exposed iron will corrode very fast. Deep pitting will result, presenting the most dangerous form of corrosion.

Different concentrations of the electrolyte at different points will also produce different potentials. They are called concentration cells. This explains the accelerated corrosion at the water line. Here, oxygen is more concentrated than it is below the water line and is easily replenished from the atmosphere.

The electro-chemical process of corrosion is always the same. Only the speed of corrosion varies with different environments.

The electro-chemical theory of corrosion supplies us also with the tools to overcome the ravages of corrosion. To prevent corrosion, we have to prevent the formation of a galvanic cell. Since three conditions are necessary to form the cell, and no current can flow if one condition is missing, all we have to do is either void different potentials, or the formation of an electrolyte, or prevent reaction on the anode or cathode. Theoretically, this sounds easy, but in practice it is difficult. It would be very interesting to go into this subject in detail, but it would be beyond the scope of this paper. It is sufficient to mention that, to prevent high potential differences, dissimilar metals (wherever possible) should not be in contact with each other. Mill scale, which is very cathodic to iron, should be removed. Low uniform differences of potential on the iron surface itself result only in slow and uniform corrosion, which is not nearly as dangerous as deep pitting. To prevent the formation of an electrolyte, the protective coating should have the lowest possible permeability and the highest electrolytic resistance consistent with other desirable features. Reaction on the anode or the cathode is prevented or slowed down by rust-inhibitive pigments.

CATHODIC PROTECTION

In discussing the electro-chemical theory of corrosion, it was pointed out that corrosion of iron is accompanied by an electric current flow from the corroding metal, which becomes the anode or positive electrode, through the electrolyte to the cathode. It was further stated that corrosion cannot take place if this current does not flow. It is, therefore, logical to assume that if a current is introduced which flows in the opposite direction of the corrosion current, this current will either neutralize the corrosion current or, if stronger, will make the iron negative or cathodic. In both cases, corrosion of iron should stop. This is actually the case and cathodic protection is based on these facts.

If an unpainted steel tank is filled with water, numerous local galvanic cells will form on the steel surface for reasons discussed before. Iron will go into solution on the anode of these local cells, starting the process of corrosion. If rods of carbon, graphite, platinum, zinc, aluminum or magnesium are suspended in the water, connected by wires with the steel shell, and an electric current of sufficient density applied from an outside source so that these electrodes become positive or anodic and the shell itself negative or cathodic, no corrosion of the tank will take place. These electrodes will or will not corrode, depending on the material. If magnesium metal is used as the electrode, it will become, even without additional current, the anode and go into solution, because its electromotive force is so much higher than that of iron. Magnesium will sacrifice itself, and the iron will not corrode. A sacrificial electrode like magnesium will be used up after a certain time and must be replaced. Whether sacrificial anodes are used alone or in combination with outside current, depends on the specific resistance of the electrolyte and the current requirements.

Cathodic protection is considered too expensive to be used alone. A combination of a protective coating and cathodic protection will give the best results, because an insulating coating will reduce the current density requirements and the cathodic protection will take care of any holidays or partial breakdowns in the film.

The selection of the right type of protective coating is very important, and the density and distribution of the current applied is quite critical. Therefore, every application must be studied individually. It is beyond the scope of this paper to go into the details of cathodic protection, and only a few highlights can be pointed out.

The coatings which give the best protection to submerged steel like those based on coal-tar pitch, asphalt, vinyl resin or chlorinated rubber are also the best in combination with cathodic protection because of their high electrical resistance, high alkali resistance, low permeability, and good adhesion. The high alkali resistance is necessary because cathodic protection tends to increase the hydroxyl ion concentration at the metal surface.

The required current density depends on the oxygen and salt concentration in the water, the velocity of the water, the prevailing temperature and other factors. Too

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high a current may lead to severe blistering or even to total removal of the coating.

It has been reported that voltage above 1.1 volt will lift most coatings. Therefore, an "Automatic Potential Control" System is recommended.

Ice formation, which will damage the suspended electrodes, has also to be taken into consideration, and may limit the use of cathodic protection to those months of the year when no ice is formed.

Cathodic protection is no cure-all, but it is certainly an important contribution to the protection of steel structures because it offers added protection from corrosion.

SURFACE PREPARATION OF STEEL

Proper Design Factor: Tubular versus Angular

When a steel structure is being designed for an industrial plant with severe chemical corrosion, the fact is often overlooked, that it must be protected later with chemical and corrosion resistant coatings.

Many times, by no means always, the steel structure could be so designed, that its protection and maintenance can be easily accomplished. For instance, angle iron construction is very hard to protect, because it has so many more sharp edges than tubular construction. Sharp edges are notorious trouble makers and corrosion will always start along the sharp edges and then spread to the flatter surfaces.

Some designs show overlapping steel members, which are riveted or tackwelded together leaving open spaces between the members, which can never be protected, because there is no way to get protective coatings inside. They are a constant source of trouble, because corrosion starting in these crevices will first run down and discolor the surfaces, and then will undercut the protective coating on the outside and start overall corrosion.

The value of a coating system depends to a great degree on its adhesion to the surface. This adhesion is mostly molecular attraction, also called specific adhesion, and to a smaller degree, mechanical anchorage. To achieve molecular adhesion, the paint must come into intimate contact with the metal surface. Any interference from moisture, dirt, grease or rust will prevent close contact and decrease adhesion. Mechanical anchorage depends on the shape and the depth of the surface irregularities either present or developed by chemical or mechanical means.

The importance of removing rust, mill scale and weld deposits before painting cannot be stressed too much. The old saying, "rust begets rust," is only too true.

Rust is hygroscopic and will hold moisture for a long time. If rust is painted over, rusting under the paint film will continue, and since rust has a larger volume than iron, the coating is lifted in places, the blisters break, and atmospheric corrosion gets a start.

Mill scale is a thin layer of blue-black iron oxide formed when hot steel is rolled or forged. It bonds tightly to steel and gives a certain initial protection. If it would stay tight, it could furnish an excellent foundation for paints. However, its expansion and contraction differs from that of steel. Eventually, it will crack and lose its bond. Since mill scale has a lower electro-motive force than iron, small galvanic cells will form on each crack, and severe pitting may occur. Mill scale is a potential troublemaker and should be removed.

Weld deposits like flux, slag, and spatter must be completely removed before painting, because no paint will get sufficient bond on flux nor cover the high spots of slag and spatter. Serious corrosion cannot be avoided if these deposits are not removed.

Years ago, it was common practice to let structural steel weather and rust for some time to remove mill scale, then to derust the steel superficially by hand wire-brushing and paint it. This procedure is very unsatisfactory, and is rightly losing favor. Weathering seldom removes all mill scale, and partly removed mill scale is a worse foundation for paint than mill scale still intact.

It is beyond the scope of this paper to describe all the different methods of cleaning structural steel in detail. A few highlights must suffice.

Cleaning methods range from manual scraping and wire-brushing to power-scaling, power-brushing, flame-cleaning, pickling and blasting. The least efficient method, but the most frequently used, is scraping and wire-brushing by hand. The best method, but the least often employed, is sandblasting.

Many studies have been made on the comparative durability of coatings on weathered and wire-brushed steel, and coatings on sandblasted steel. In all properly conducted tests, paint over sandblasted steel lasted up to three times as long as coatings over surfaces not thoroughly derusted. However, there are valid reasons for the hand-cleaning method. Power tools are not always available for maintenance work and sandblasting may be too expensive. Sandblasting may also not be permissible because of machinery in the vicinity of the blasting operation which would be damaged by the fine sand.

The paint user must realize that not all coating systems can be applied to a hand-cleaned surface. To achieve sufficient bond, many of the best synthetic resin coatings require a surface which has been blasted at least to near white metal.

a. Hand Cleaning

All grease and oil present must first be removed by solvent washing. This is usually done by wiping the surface with rags dipped in solvents. Since rags are quickly soiled, they have to be washed out quite often or oil and grease will only be spread over the whole area and not removed. Heavy rust scale is loosened with chipping and sledge hammers, and the residue by scraping and wire-brushing. Loose mill scale and paint remnants are removed in the same manner. Hand cleaning will not remove all rust and foreign matter, but will present a fairly good surface for painting if a primer of high wetting power is used. After brushing or blowing off the dust, the surface is then ready for painting.

b. Power Cleaning

Power cleaning closely resembles hand cleaning and is not much faster but does a much more efficient job. Chipping hammers, power scalers, rotary wire brushes and rotary abrasive discs are employed. If power cleaning results in a highly polished surface, bonding difficulties may be experienced with the paint. Before cleaning, oil and grease must be removed with solvents.

c. Flame Cleaning

Flame cleaning is done with a burner which has a brush-like assembly of small oxygen-acetylene flames which traverses the metal one to four times. It vaporizes the imprisoned moisture beneath the mill scale, forcing the latter off. Since mill scale has a different thermal expansion from steel, application of heat cracks the mill scale and weakens its bond. Theoretically, all mill scale will be detached, but in practice, only part of the mill scale will come off. The loosened scale and powdered rust is then hand or power wire-brushed and any residue blown off with compressed air. If the dehydrated steel is painted when it is still warm and before moisture can recondense, a superior bond will be achieved.

The removal of old paint by burning presents various problems. Some oil paints are easily removed by scraping after they have been softened by the flame. But often old coatings must really be burned to a crisp at high temperature before they powder off. This high temperature may damage thin steel members, a fact which has to be taken into consideration.

d. Pickling

Pickling is done in an acid bath. It is very efficient but not feasible for large steel members. After pickling. all traces of acid have to be rinsed off, and the steel is given a pretreatment with a diluted cold solution of phosphoric acid and chrome salts, or is dipped in a hot bath of phosphoric acid and iron phosphate.

e. Sandblasting

Blasting is one of the best methods of cleaning structural steel. Sand, synthetic or metallic abrasives in different sizes and shapes are widely used to remove oil, grease, mill scale, rust, old paint and other foreign matter from steel or other surfaces. These abrasives are blown against the surface with great force at high velocities through nozzles, propelled by compressed air, or are thrown off a centrifugal wheel. The latter system is only used in shop work. Choice of type, size and shape of abrasives is governed by the particular job. Not only does sandblasting clean the steel, it also roughens the surface, giving a better anchorage to the paint.

However, unsuitable size of abrasive and too high a velocity may roughen the steel so much that ridges and peaks are formed. The coating thins out over these high spots and therefore cannot give the required film thickness. The roughness – that is, the difference between valleys and peaks in the blast pattern – must not be greater than approximately one-third of the thickness of the coating system. *This rule is very important.* If this rule is not followed, the surface may be in worse shape for painting than if solvent cleaning and wire brushing had been employed. If the damage has already been done, the thickness of the coating must be increased by additional coats, no matter what the original specification called for, or there will be an early failure.

Industry is indebted to the Steel Structures Painting Council for the definition of surface conditions to be achieved with sandblasting and for setting up standards to achieve this end. The Council distinguishes four different degrees:

1. *Brush-off blast cleaning.*
2. *Commercial blast cleaning.*
3. *Near-white blast cleaning.*
4. *White metal blast cleaning.*

The equipment for these four types of blasting is the same. The difference consists of the speed with which the nozzle is moved and the distance of the nozzle from the surface. The faster the nozzle is moved and the further it is held from the surface, the less is the force with which the abrasive is thrown against the surface and the less foreign matter will be removed. On the other hand, the slower the nozzle is being moved and the closer it is held against the surface, the more the abrasive will bite into scale and rust till in the end the white metal is exposed.

Brush-off blast cleaning will remove loose mill scale, loose rust and deteriorated paint. It will not remove tightly adhering mill scale or rust and excess grease and oil, which have to be removed by solvent washing. Under mild exposure conditions, this economical method will be sufficient.

Commercial blast cleaning is superior to brush-off blast cleaning, because it will remove all mill scale, rust, old paint and foreign matter. It will not remove the grey film underneath the mill scale, which gives the blasted surface a streaky grey appearance. Surfaces to be submerged should be cleaned at least to near white metal.

Near-white blast cleaning is superior to commercial blast cleaning, because it will remove at least 95% of interference matter.

Blast cleaning to white metal is the ultimate in surface cleaning. Here everything is removed, exposing clean white metal.

Sometimes mill scale is loosened or removed by weathering before the steel is sandblasted according to one of the types outlined above.

No matter to what degree sandblasting is carried, dust and blasting residue must be carefully cleaned off by brushing or blowing with compressed air before painting is started. Chemical pretreatments or priming should commence immediately after blasting, because sandblasted steel is in an activated state and will rust rapidly.

The type of blasting should be specified by the engineer. The Surface Preparation Committee of the National Association of Corrosion Engineers emphasizes: "a product that must perform a lifetime of service, without subjecting it to impact or high vibration stresses, will hold a coating as effectively on a surface that was prepared with the brush-off method than the one that received a white steel preparation. However, if impact and other surface forces will produce undue stresses between metal and coating, nothing less than a commercial surface preparation should be selected. In some cases, the white steel surface will be necessary."

PRETREATMENT

The durability of a paint system on steel can often be increased by a pretreatment which, however, does not take the place of a primer but must be applied ahead of it. The most commonly used pretreatments are:

1. *Wetting Oils*
2. *Wash Primer*
3. *Cold Phosphate Treatment*

WETTING OILS are special penetrating drying oils often reinforced with small amounts of resin to speed up drying and give a harder surface. They soak into porous rust scale and other contaminants, satisfying their oil hunger. This pretreatment does not take the place of cleaning and priming, and must not be considered a coat by itself. It should be used only where, for some reasons, a thorough cleaning job cannot be done. Since wetting oils satisfy the oil absorption value of the porous rust and scale, the primer will not be robbed of part of its vehicle which would otherwise sink into the pores. The primer applied over the wetting oil film must be compatible with it and bond to it. Lacquer-type coatings, like chlorinated rubber paints, vinyl paints, or coal-tar paints which contain powerful solvents, cannot be applied over wetting oils because they would lift and wrinkle the oil film.

A WASH PRIMER is a basic zinc chromate, vinyl butyral phosphoric acid treatment often used on clean steel right after sandblasting or on some non-ferrous metals. It forms a thin film which adheres tightly to the metal, because the components of the wash primer react with each other and the metal forming a phosphorous-chromium-resin complex. The film must be thin, not more than .5-mil thick, and no hiding should be expected, or even attempted, because only in thin films will the wash primer properly react with the steel without leaving any unreacted residue. Most paints adhere well to the wash primer.

THE COLD PHOSPHATE TREATMENT consists of applying a diluted solution of phosphoric acid, wetting agent and a special solvent to clean steel especially after sandblasting. It must not be used over scale or rust. Any residue which forms on the steel must be wiped off with moist rags. This is a nuisance on large steel structures, because it entails another operation. If, however, the phosphoric acid solution is carefully adjusted so that all the acid can react with the metal, this wiping off should not be necessary.

There are numerous other chemical treatments of steel available, which are beyond the scope of this paper.

RUST-INHIBITIVE PRIMERS

The ideal procedure in protecting steel would be to ship the fabricated steel uncleaned and unpainted to the job site just before erection; to sandblast the steel in the field; and to apply the paint system suited for the specific exposure and environment to the sandblasted surface. This is usually not practical. Most steel is shipped from various mills to the fabricator, who has to take care of the cleaning and priming, and is then shipped to the job site where it may lie around for many months.

An ideal rust-inhibitive primer should have the following characteristics. It should:

1. *adhere tenaciously to the metal for the whole life of the paint system.*
2. *furnish a mechanical and electrolytical barrier to the diffusion of water, oxygen and corrosion accelerators.*
3. *prevent corrosion of the metal if corrosive materials should diffuse through the film.*
4. *be compatible with the top coats.*
5. *have a long life without top coat.*

No single primer can meet all these requirements, so various compromises must be made.

Regarding point 1: Organic coatings as a whole have good adhesion to clean steel. In the case of rusty or contaminated steel, however, only coatings with high wetting power will adhere satisfactorily. They must be able to penetrate the porous rust, creep into pits and under cracked mill scale and expel the moisture present. One of the best penetrating vehicles is raw linseed oil; one of the worst is a quick-drying straight synthetic vehicle.

Regarding point 2: The strength of the barrier depends on the permeability of the film. Most organic coatings are semi-permeable membranes which will, under certain conditions, let water and dissolved gases and corrosion accelerators diffuse through the paint film to the metal to form an electrolyte. The higher the permeability the easier will moisture diffuse. Linseed oil has very high permeability; a straight synthetic vehicle, depending of course on the type of resin, a very low permeability.

Regarding point 3: The inhibition of corrosion after corrosive agents have diffused, depends on the rust-inhibitive pigments which are added to the primer vehicle. We are not concerned here with the mechanism of inhibition, be it sufficient to mention that red lead, zinc chromate, strontium chromate, basic lead chromate and zinc dust are the most widely used rust-inhibitive pigments. Coatings of exceptionally low permeability and high electrical resistance, like bituminous coatings and certain vinyl paints, furnish such a strong mechanical barrier that if they are applied to clean steel at high mil thicknesses, a primer containing rust-inhibitive pigments is not necessary.

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Regarding point 4: The top coat must adhere to the primer, that is, be compatible. The solvent of the top coat must "bite" into the primer by slightly dissolving the top surface, but not to such a degree that the primer will be lifted.

Regarding point 5: The lapse of time between shop priming and field painting is unpredictable. It may be weeks, it may be as long as a year. The exposure conditions for the primer during this period may range from dry rural air to moist industrial atmosphere. A slow-drying linseed oil primer with a very long life may not have the necessary hardness if top-coated too soon. This may cause cracking of the harder top coat. On the other hand, a faster drying synthetic type of primer, more suited to industrial atmospheric conditions, may not have the long life which is desirable if the application of the top coat is delayed for a long time.

One can readily see that a compromise must be made. For example, the amount of rust-inhibitive pigments contained in a primer depends mostly on the price the customer is willing to pay. Other desirable features of a good primer, such as excellent wetting properties which are desirable in the case of contaminated steel, and low permeability, cannot be achieved at the same time. A happy medium must be reached by formulating a primer which fills a good part of each requirement. The situation becomes even more complicated when the same shop primer is used for steel which will be painted over with strong solvent paints such as coal tar paints, chlorinated rubber paints, etc., and steel which will be top-coated with mild solvent paints such as oleoresinous enamels. Here, the selection of a shop primer which is compatible with both types of coatings is imperative.

ZINC-RICH PRIMERS

Zinc-rich primers are termed permanent primers because they come closest to meeting all the requirements of an ideal rust-inhibitive primer. Properly formulated, a zinc-rich primer performs two functions. Initially it is electrically conductive, protecting cathodically. The exposed surface zinc reacts with oxygen and carbon dioxide in the air to form insoluble zinc salts which fill all pores and cover all surfaces of the film. It then acts as a barrier coating. This in turn protects the free zinc in the film, allowing it to remain dormant until the film is damaged. When damaged, the cycle is repeated.

Long-term exposures conducted on various zinc-rich coatings of different producers have revealed two distinct catagories:

Fast-Sacrificing Types

1. *Galvanizing*
2. *Metalizing*
3. *Most self-curing inorganics*
4. *Most organics*

Slow-Sacrificing Types

1. *Post-cured zinc silicates or those containing some lead*
2. *Few self-cured inorganics*
3. *Epoxy zinc-rich*
4. *Very few organics*

The picture shows a definite correlation to that of cathodic protection. Where just sufficient current is used to neutralize, the anode life is long; conversely, where high current is used, the anode quickly sacrifices itself. Zinc-rich paints are anodes applied directly to steel and act in the same manner. The ideal zinc-rich formulation is one that is sufficiently conductive to quickly form an effective barrier coating. Those that are too highly conductive constantly blast away the barrier coating as it forms and rapidly waste away. Both types are useful under proper exposure environments. In rural areas or extremely mild atmospheres, the fast sacrificing types function best (example, galvanize will last 20+ years). In heavy chemical or marine environments, these deteriorate rapidly even when topcoated. The reverse is true with the slow sacrificing types. This indicates then that four distinct types are necessary to cover all exposure conditions:

1. *Fast sacrificial action for very mild or rural exposures.*
2. *Medium sacrificial action for moderate exposures.*
3. *Low medium sacrificial action for moderate chemical exposures.*
4. *Slow sacrificial action for marine and extreme chemical exposures.*

There are two distinct classes of zinc-rich primers, inorganic and organic. These designations refer to the type of binder used. They shall be discussed separately.

Inorganic Zinc-Rich Primer

The most commonly used binders are the alkali metal silicates, sodium, potassium or lithium. Sometimes an organic silicate which has been partially hydrolized is used, tetra ethyl silicate. The phosphates and titanates are occasionally used. Quaternary ammonium silicate is a relatively newcomer with good possibilities.

Inorganic zinc-rich primers are of two types; those which are post cured, utilizing an acidic solution or a high bake to render the silicate water insoluble, and those which are self-curing. The post-cured products are the most foolproof and have the longest applied history. Inorganics are furnished in two component packages with the post-curing agent in a third package. When mixed they have a limited effective pot life. They remain water sensitive for many hours after application and require correct temperature and humidity conditions during application. They require white metal blast cleaning and a chemically clean surface. They may only be applied in film thicknesses of 4-5 mils or they are subject to mud cracking and do not cure properly. Properly applied and cured they are one of the most effective protective coatings. They have extreme abrasion resistance, withstand temperatures up to 1,000°F and are extremely durable even without topcoats. One of their major drawbacks is their lack of ability to satisfactorily bond topcoats, however, this has been overcome through the use of tie-coat primers. They are unaffected by solvents or salt water and are therefore widely used to line storage and ballast tanks carrying

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fuels, offshore drilling rigs and ship hulls.

The self-curing types are a later development and have not proven to be fully effective. Their performance has been erratic and unpredictable. Since their curing is largely dependent on temperature and humidity, this is understandable. A few have internal catalysts which somewhat overcome external conditions.

Organic Zinc-Rich Primers

Organic zinc-rich primers are as the name implies, zinc dust dispersed in an organic binder. In the past they have been compounded in just about every known paint vehicle and not surprisingly have produced about that number of results.

In recent years reliable formulators have carefully selected appropriate vehicles and the resulting coatings rival the inorganics. The better types are epoxies and those formulated with thermoplastic polyethers. The epoxies are limited to application above 50°F or they do not cure properly. They also continue to increase in hardness and become very brittle. Excessive humidity during application can cause improper curing and recoating can be a problem. They are furnished in two component packages.

The polyethers cure solely by solvent evaporation and are unaffected by humidity or temperature. They are thermoplastic and easily recoated and never become brittle. Furnished in a single package ready to use condition they are easy to apply and far easier to topcoat than the inorganics. They tolerate poorer surface preparation.

Properly formulated the organics possess the same properties as the inorganics with the exception of temperature resistance which is lower as might be expected. Adhesion, abrasion resistance and durability are about equal due to the barrier coat formation of the zinc salts on the film surface.

DETERIORATION OF CONCRETE

Not only metal but also concrete will corrode and deteriorate. Concrete is a combination of sand, gravel and crushed stone mixed with cement and water, which hardens into an artificial stone. Cement is essentially a mixture of complex calcium silicates, calcium aluminates and calcium aluminum-ferrites. The predominance of calcium makes it strongly alkaline. These compounds in powder form bind water chemically, forming a monolithic stone in the course of hydration. Only the first stage of its hardening process is completed after the customary so-called 28-day curing period; further hardening and chemical conversions will continue for many years. During the initial hardening of the concrete, a certain amount of free lime is separated. This free lime is gradually converted into calcium carbonate by reaction with the carbon dioxide from the air and to a lesser degree from the water (if concrete is submerged). This gives the concrete additional strength. Chemically, concrete is neither a dead nor a dormant substance, but one in which chemical conversions continue to take place. Fresh concrete is especially vulnerable to chemical attack and so requires protection.

Every attack on concrete is caused by a liquid of some kind. Dry gases, with very few exceptions, have no effect. Although chemical reactions which can affect concrete are possible only in the presence of moisture, it should be kept in mind that even very small amounts of moisture can start such reactions.

Concrete is not attacked by ordinary water or alkalies, but it is very sensitive to even weak acids and certain salt solutions which destroy by chemical reactions the binding properties of the cement, damage the structure, and in extreme cases may cause total disintegration.

All free acids will attack concrete and destory it in the course of time. A good example is sewer gas. Sewer gas consists chiefly of hydrogen sulphide resulting from the decomposition of organic matter. Since it is readily soluble in water, it condenses on the walls of sewers or the underside of covers of sewage tanks in waste treatment plants. Hydrogen sulphide is a weak acid and, like other acids, it forms water soluble lime salts. Therefore, in the presence of water, hydrogen sulphide can leach salts out of concrete. However, since it is a very weak acid, this process of forming lime salts and leaching out the cement would take a long time. The chief danger of hydrogen sulphide lies in its tendency to oxidize. Hydrogen sulphide and sulphide salts are oxidized through contact with air. It is immaterial whether it is assumed that hydrogen sulphide combines first with the lime of the concrete to form calcium sulphide which is then oxidized to calcium sulphate, or whether, in the presence of large quantities of oxygen, sulphuric acid is first formed which then combines with the lime of the concrete to form calcium sulphate. The final product is always calcium sulphate which is very destructive because it combines with the alumina which is found in all cements to form the double salt: calcium-aluminum-sulphate. This double salt crystallizes with thirty molecules of water. Due to its high water content, the newly formed combination requires much more space than the former substances by themselves. The crystallization creates this space by bursting the concrete.

When the concrete is thus split open, water can enter into its interior and inasmuch as calcium-aluminum-sulphate is very unstable, when it comes in contact with this excess water, the calcium-aluminum-sulphate breaks up into two parts, aluminum hydroxide and gypsum. The gypsum crystallizes out, and the aluminum hydroxide separates as a slimy, cheesy mass. This slimy substance inside the sewer gives definite proof that the concrete is disintegrating. This type of deterioration is the most dangerous and the most frequent.

In the case of disintegration due to hydrogen sulphide, it is important to remember that the destruction takes place mainly or exclusively above the water level. Below the water surface, the main effect is a leaching action and not serious.

Solutions containing salts are far less dangerous than those containing free acids. Only the sulphates

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of sodium, magnesium and ammonium are really dangerous. These salts are found in sea water, factory waste water, and some ground water.

Other solutions which attack concrete are sugar solutions, some fermenting liquids, ammonium chloride, magnesium chloride, ferric chloride, ammonium nitrate, vegetable and animal fats and oils, and mineral and tar oils (if they contain free acids).

Besides these various forms of chemical attack, concrete is physically damaged by spalling and cracking. Moisture penetrates the concrete from the outside or is drawn up into it by capillary force. In cold weather, the moisture freezes in the pores, causing spalling. Any coating or protective treatment which keeps moisture from entering the concrete prevents this occurrence.

If concrete is to be painted to protect it against aggressive fumes or liquids; to make it more watertight; to facilitate cleaning; or for decorative purposes, the alkalinity of the concrete itself must be considered. Only such coatings should be selected which in themselves are fully resistant to the alkalinity of the concrete.

SURFACE PREPARATION AND PAINTING OF CONCRETE

Concrete as well as steel, must be cleaned before painting. Painting greasy, dirty or dusty concrete is just as bad as painting rusty and unclean steel. Grease should be removed by washing with a solution of trisodium phosphate and soap chips in water. If foreign matter is not removed the paint will not obtain a satisfactory bond on submerged surfaces and peeling will be the result.

To protect concrete against chemical attack the coating must be pore-free and have excellent bond. This is not easily obtained. In general it is more difficult to paint concrete successfully than other substrate because there are so many methods of casting and finishing concrete. Concrete may be poured against forms, sprayed on as gunite or cast centrifugally. The finishing may consist of wood or steel trowelling.

One of the troublemakers is airpockets on the surface. In painting, some of the holes, especially the small ones are bridged and when the solvent goes into these holes, the solvent fumes will mix with the air in the holes, expand during evaporation and form blisters and bubbles, which may break exposing the original hole. Sacking with cement grout or rubbing the concrete with carborundum stone and cement grout immediately after removing the forms are the common remedies.

Steel has its mill scale; concrete has its laitance, which is an incompletely hydrated cement scum, which floats up, and just clings to the surface. This laitance is the cause of most of the early bond failure of a protective coating on concrete. The laitance must be removed by wirebrushing and etching with acid, or even better by slight sandblasting (whip blasting). Laitance is especially bad on the interior of centrifugally spun concrete pipes.

No concrete hardeners should be used with concrete, that will be painted later, because they will kill the adhesion and prevent proper acid etching. Certain curing compounds are also detrimental to adhesion.

Any holes opened up by etching or whipblasting should be closed by stoning, taking care that only the actual holes are filled and all excess grout is carefully removed.

Forms for pouring concrete should be coated with materials that do not leave a residual film on the concrete. Form oils or waxes which stick to the concrete must be removed or the coating will peel. The removal of waxy residue is not easy because an acid wash will not be sufficient and only whip sandblasting will prepare the surface properly.

Steel trowelled concrete and steel form concrete are often glazed and are too smooth to be painted without etching or whip sandblasting to give them a profile for best adhesion.

Regarding etching of concrete, it should be pointed out, that if the treated surface is not scrubbed and flushed with sufficient water to remove all traces of the acid and salts formed by the etching, these water soluble chlorides may induce severe early blistering because of osmotic action. A mild alkali rinse with trisodium phosphate or a mild caustic solution and further rinsing with clear water will eliminate the danger of blistering.

Concrete or cinder blocks vary from high porosity to actual large holes. Painting with low viscosity decorative or protective coatings gives a very unsatisfactory appearance, because the paint is absorbed by the porous surface. Therefore it is necessary to first apply a surfacing coat which will plug all holes and kill the porosity. The most popular types are emulsion-sand mixtures with or without cement. If a smooth surface is desired on cinder blocks, a heavy plaster coat of this type material must be applied.

SUPERVISION, INSPECTION, AND THE SUCCESSFUL JOB

Most paint application troubles can be traced back to a failure to closely follow the engineers' specifications. These specifications call for the application of paints "in accordance with the manufacturer's instructions." The conscientious painting contractor understands that this phrase automatically makes the manufacturer's instructions an important, integral part of the specifications. He reads – and follows – them with the greatest of care.

Unfortunately, there are painting contractors who lean entirely on their past years of experience in handling the usual run of paint. One job is about the same as another to them. Give them *any* new paint and they'll apply it in the same manner as they have painted hundreds of times before. The special problems involved in sewage plant or water works painting, for example, do not receive the close study they require. The same is true of handling specialized coatings; carefully written directions on the paint cans are ignored. Such contractors apply the paints "their own way" feeling they have nothing more to learn.

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The supervisor should educate the applicator, give him practical instructions and make sure that all essential details are understood.

At the first sign of poor workmanship – the resident engineer steps in and explains just what is expected of the painter. By tactfully pointing out that the new coatings require special handling, he should be able to convince the contractor that the manufacturer's instructions must be adhered to. The resident engineer then gives the necessary extra attention to the job – from surface preparation on up. His industry should be contagious and reflected in the contractor's own determination to give the job the care it requires.

Such close control is not required in the case of the conscientious contractor who knows that the manufacturer's painting instructions *blueprint* his painting procedure and must be followed just as closely as his other "blues." He does not assume that all paints can be handled the same way. He studies the manufacturer's instructions to learn what the manufacturer has found, by experience, to be required in surface preparation, priming, thinning, application, etc.

He knows, too, that while paint may be a relatively small part of a construction job, it's the first line of defense against destructive attack on the structure itself.

Therefore, he and his supervisor, the resident engineer take great pains, to see that such points as these are watched:

1. *The surface must be properly prepared – no dirt, no rust, no mill scale left on.*
2. *The surface must be free of dew or other moisture. Painting a wet surface must never be permitted; and the threat of rain is the signal for stopping work. Another factor is the temperature at which application is made. The danger point is 40°F, especially if the temperature is dropping. Higher temperatures are very desirable and necessary for some types of coatings, such as emulsions and cured epoxies.*
3. *The paint must be properly mixed, boxed and applied. If thinning is required, the thinner specified by the manufacturer must be used.*
4. *In the case of epoxies or other two-component materials, the contractor must watch the limited potlife and necessary sweating time once the two components have been mixed together. Applying materials that have been allowed to sit around for more than the alloted potlife will result in poor adhesion or complete failure.*
5. *The proper dry film thickness must be achieved, and the film must be free of holidays, pinholes, and other deficiencies. Sharp edges, bolts, rivets, etc., are difficult to protect and should therefore be given extra protection and very close inspection.*
6. *The applicator must know what he is doing and if not must be instructed.*

Thinning paint excessively in order to get the job done and over with, is dangerous! If, for example, the engineer has specified a paint with a high build, his instructions are being disregarded if the painter thins the paint down in order to save elbow grease. After all, in meeting paint specifications, the vital consideration is to secure the proper dry film thickness – not simply to see that a certain number of coats of paint are applied or that the number of gallons of paint purchased are used up.

In this connection, it should be mentioned that there are four types of inspection devices available to the corrosion engineer for the quality control of protective coatings in the field. These are the magnetic dry film gauge for measuring the thickness of coatings applied over steel; the wet film gauge for measuring the thickness of each coat of material as it is applied; the electrolytic quality meter which utilizes the change in electrical resistance of a coating to detect poorly coated areas and the High Voltage Spark Tester. Each type of device is manufactured by several manufacturers and in varying sensitivities and price ranges.

PRINCIPAL TYPES OF PROTECTIVE COATINGS

Bituminous Paints and Hot Enamels

a. Coal Tar Types:

Bituminous coal, a very complex chemical mixture decomposes into simpler components when heated in retorts without air between 1900 and 2000 degrees Fahrenheit. Gas, aqueous liquor and coal tar are driven off, leaving coke as residue. The coal tar is dehydrated and heated in stills to yield oil and coal tar pitch. Depending on the source of the coal tar and the amount of heat applied, pitches of different characteristics are obtained. When used as a base for superior coatings, coal-tar pitches are reprocessed, and any corrosion-accelerating substances are removed. Various types of coal-tar pitches are then blended together.

Coal-tar paints are made by dissolving the processed pitch or blend of pitches in suitable solvents. They dry by evaporation only. Skill and experience are essential in compounding coal-tar paints because similar physical characteristics of raw materials do not necessarily mean similar behavior of the finished product under exposure. The raw materials selected for the blending, the degree of refining, and the addition of other modifiers, often, in very small quantities, decide the final merit of the coating.

The outstanding quality of coal-tar paints is their extremely low permeability, their high electrolytic resistance and their remarkable resistance to the disintegrating action of water. There are hardly any materials, old or new, which are as water resistant as properly compounded coal-tar coatings. They will not be affected by mineral oil, but may be dissolved by vegetable, and animal oil, grease and detergents, if they are in direct contact with them. Their resistance to weak mineral acids, alkalies, salts, brine solutions and other aggressive chemicals is good. Furthermore, coal tar paints give more value per dollar than any other protective coating. This fact should not be overlooked when selecting paint for a certain job.

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There are six main types of coal tar coatings:

1. *Thin coal-tar pitch solutions without any filler.*
2. *Heavy coal tar pitch solutions with inert fillers added.*
3. *Very heavy coal-tar pitch coatings containing inert fillers possessing a thixotropic gel structure but only medium inherent viscosity.*
4. *Heavy coal-tar emulsions containing inert fillers and having low inherent viscosity.*
5. *Hot applied coal-tar coatings.*
6. *Coal-tar epoxies.*

The first three types are solutions and have about the same chemical and water resistance. They vary mainly in the thickness of the film which can be laid down in a single coat. The fourth type, coal-tar emulsions, are dispersions of coal-tar pitch in water and are inferior in corrosion resistance to the solution type. This is not the fault of the pitch itself, but is caused by the higher permeability of the applied film. Pitch particles dispersed in water are relatively large and do not coalesce as completely after drying as the much smaller dissolved pitch particles do. But coal-tar emulsions have other very good features which will be mentioned later.

A thin coal-tar solution of low viscosity with a solid content of 60 to 70% and a spreading rate of 300 to 400 square feet per gallon, gives an approximate thickness of 1.2 mils per coat. This thickness cannot be increased. because the thin solution cannot be applied at a lower rate without sagging. To achieve a heavier coat, a filled coal-tar solution must be used, which, in addition to its higher solid content, can be applied at approximately 180 square feet per gallon without sagging. This produces an approximate thickness of 6 mils. To apply even heavier coatings by brush, a gel type must be selected which can be applied at the low rate of 75 square feet per gallon without sagging. This will produce a thickness of approximately 16 mils in one coat. Coal-tar emulsions will not sag at a coverage of 75 square feet per gallon and give approximately a 12-mil thickness in one coat.

Coal-tar paints afford protection by the mechanical exclusion of moisture and air. If they are applied as a continuous film without holidays, they give almost perfect protection. Since it is impossible to avoid pinholes and flaws in a one-coat application, more than one coat will be necessary.

Concrete, as a rule, can be protected with thin coal-tar solutions, but steel requires heavier coatings which will form an almost impervious barrier against severe corrosive influences.

All coal-tar paints "alligator," more or less, in the sun. The paint film will look like an alligator skin, hence the name alligatoring. This alligatoring is a surface defect. It is brought about by the hardening of the upper layer of the film, stimulated by the sun's rays. This causes the upper layer to contract, crack and slip over the lower stratum which is still soft. If not enough coats are applied, these alligator marks can go right down to the metal, opening the path for atmospheric corrosion. Alligatoring does not (or only to a limited degree) occur under water where the coating is protected from the rays of the sun. Coal-tar emulsions do not produce this phenomenon, probably because the pitch particles are not fused as tightly as in solution types; therefore, coal-tar emulsions can be used as top coats over badly alligatoring heavy coal-tar paints.

Another popular method to prevent alligatoring of heavy coal-tar coatings, which are temporarily exposed to sun and air before submersion, is the spray application of a special white wash made as follows:

Add slowly and simultaneously 150 pounds of processed quicklime and one gallon of boiled linseed oil to 50 gallons of water, with 10 pounds of salt dissolved therein. While being mixed and for fifteen minutes thereafter, the mixture shall be stirred continuously and allowed to cool. It shall be free from lumps and foreign matter. The whitewash shall be aged for at least 3 days before application. (Navdocks Specification 34Yc).

The solvents used in coal-tar pitch coatings are strong in odor and adequate ventilation is necessary during application. Coal-tar emulsions, which use water as a volatile thinner are in this respect superior and should be used where proper ventilation is not possible. Bear in mind, however, that their protective qualities are inferior.

Coal-tar paints give excellent protection at low cost in dam and flood-control installations, penstocks, piers, marine work, etc.

The fifth type, coal-tar pitch, reinforced with inert fillers and applied in a molten state over a primer is called in the trade, coal-tar enamel. These enamels have all the good qualities of coal-tar paints, but in a higher degree, because the coating is very thick and does not depend on the evaporation of solvent to set.

Coal-tar enamels are used extensively for the exterior protection of steel pipelines with or without a reinforcing wrapper. They are applied by machine or by hand daubing. For the interior lining of steel or concrete pipes, coal-tar enamels are applied by centrifugal spinning. This process furnishes an extremely smooth surface and cuts down friction between pipe surface and moving liquid.

Coal-tar enamels are furnished in different types depending on service conditions such as extremes in high and low temperatures or variations in soil stresses. These stresses are caused by certain types of soil encountered in laying underground pipelines. The modifications consist mainly of different degrees of plasticization and the amount of filler added to the coal-tar enamel.

It is possible to protect numerous other surfaces with coal-tar enamels, but generally cold-applied heavy coal-tar coatings are preferred because they are easier to apply, stand change in temperature better than coal-tar enamel, do not require a specially trained working crew and cost only half as much.

The sixth type, coal-tar epoxy is discussed under epoxy resin coatings.

b. Asphaltic Types:

Asphalt is a term applied to certain bituminous substances which occur either in a natural state or are

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obtained as residue from the distillation of asphaltic petroleum.

The best known type of natural asphalt is gilsonite which occurs in a number of parallel vertical veins in Utah and Colorado and is mined in a rather crude way much the same as coal. The best grade, gilsonite select, is a dark-colored, comparatively hard bitumen which has excellent chemical-resistance and good weather-resistance. It is one of the most valuable components in the better grades of asphaltic coatings.

Asphalts obtained from the distillation of asphaltic petroleums vary in their chemical and physical characteristics according to the nature of the crude petroleum, the length of the distillation process, the temperature to which they are subjected and whether dry steam or air is introduced during the distillation. Steam-distilled asphalt is asphalt obtained when dry steam is introduced into the bottom of the still during distillation (which minimizes thermal decomposition of the residue). It has high stretching power, but is lacking in toughness and is very susceptible to temperature changes. Air-blown asphalt is asphalt obtained when air is introduced into the bottom of the still during distillation (which polymerizes the residue forming more complex molecules). It has low stretching power, but is tough and rubber-like and much more resistant to temperature changes.

By taking advantage of the different characteristics of gilsonite, steam-distilled, and blown asphalts, numerous asphaltic coatings can be produced by dissolving these asphalts either alone or in blends of different proportions. As a rule, the higher the proportion of gilsonite, the better the coating will be.

These asphaltic paints dry by evaporation only. They are more weather-resistant than corresponding coal tar paints because they do not alligator, but are inferior in water-resistance. Since the solvents used in their manufacture are mild, they do not give taste to water coming in contact with them. Consequently, asphaltic paints are frequently used in painting steel tanks and concrete reservoirs storing drinking water. These paints may be heavily reinforced with inert fillers to make very thick, durable coatings giving superior protection at low cost against very severe corrosive conditions. They are at the same time very weather-resistant because the tightly packed fillers protect the asphaltic components against the destructive rays of the sun. If the inert fillers consist mainly of finely divided cork, a heavy coating can be built up which has insulating properties and will prevent condensation and sweating on cold surfaces.

Asphaltic varnishes are made from such natural asphalts as gilsonite, with or without the addition of resin, by cooking with drying oils. The resultant varnishes are very durable. Their lasting qualities depend on their oil length, that is, the more oil incorporated (up to a certain limit), the more lasting the varnish will be. Their use, of course, is limited by their black color.

Bituminous colored paints are made out of asphalt varnishes by pigmentation with strong dry colors. Since the varnish to start with is deep brown, only comparatively dark colored paints can be manufactured. But their extreme durability and low price make them very valuable coatings. They show excellent resistance to industrial fumes, condensation and the destructive action of sunlight. One drawback is the loss of gloss and chalking which occur quite soon when exposed outdoors. This, however, in no way detracts from their inherent weather-resistance.

Hot asphaltic coatings reinforced with inert fillers are often used for protecting steel and concrete. If care is taken to obtain a coating free from pinholes and blisters, excellent protection for long periods can be achieved.

Asphalt epoxies are discussed under epoxy resin coatings.

Bituminous coatings of all types can be applied over old and hardened oil and oleoresinous paints, but they themselves cannot be painted over with any coatings containing linseed or other drying oils. Oil paints and oleoresinous paints dry to an elastic but eventually very hard film. Applied over a thermoplastic bituminous coating, they cannot follow the contraction and expansion of this underlying thermoplastic material and will crack and eventually peel off. Furthermore, bituminous substances under the heat of the sun will diffuse through a dried film of oil paint and will sooner or later stain the light-colored top coat. However, bleeding can often be stopped by separating the bituminous coating from the colored topcoat with a special sealer.

OIL PAINTS

Oil paints are dispersions of one or more pigments in drying oil reduced to brushing consistency with turpentine or mineral spirits. The oils predominantly used are raw linseed oil and/or heat-treated linseed oil. Linseed oil dries slowly by oxidation and polymerization to a soft and elastic film. To speed up the drying, very small quantities of metallic salts, such as lead, cobalt and manganese, are added which accelerate the drying process. When the film structure ages, further chemical changes take place which make the film gradually quite hard and less elastic. The durability of these linseed oil paints depends to a great extent on the pigments used. Dark colors are more durable than light colors. Their alkali- and water-resistance is very poor; their acid-resistance is fair; their weather-resistance is excellent. They will protect steel very well for many years in mild environments and low humidity, but they are totally unsuited for under-water use.

Linseed oil paints are still the best coatings for outside wooden structures, and if the right pigments are selected will erode slowly by chalking, producing an excellent foundation for recoating. Where fumes such as hydrogen sulfide are present, lead pigments have to be excluded since they will badly discolor under this exposure.

The gloss of oil paints is low and whatever gloss there is diminishes rapidly through the action of the actinic rays of the sun. Oil paints are often reinforced with varnishes to increase gloss, toughness, abrasion- and chemical-resistance.

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OLEORESINOUS PAINTS

Oleoresinous paints are pigmented oleoresinous varnishes. These varnishes consist, as the name implies, of a combination of oil and resin cooked together in kettles and thinned down with volatile solvents. Driers (certain metal soaps of organic acids such as lead, cobalt, manganese naphthenates, etc.) are added in small quantities to accelerate or facilitate drying. The properties of the varnish and of the paint made from it by pigmentation are those inherent in the oil and the resin, and each of the ingredients will contribute certain characteristics. The resin will give adhesion, gloss, hardness, toughness and drying speed. It will also provide resistance to abrasion, water and chemicals. The oils will contribute flexibility and weather resistance. Most of the resins used nowadays are of the synthetic type; the oils consist mainly of linseed oil, tung oil, soyabean oil, dehydrated castor oil, fish oil – alone or in mixtures.

Varnishes differ, not only because of the types of resins and oils used, but also because of the amount of oil present. The oil content is expressed as its "oil length." The more oil present (the longer the oil length), the more the finished product shows the peculiarities of the oil. The less oil present (the shorter the oil length), the more the characteristics of the resin control the behavior of the finished product.

It is customary to express the oil length of a varnish as the number of gallons of drying oil with which one hundred pounds of resin are combined. A short-oil varnish of 15-gallon length will, therefore, contain one hundred pounds of resin and 15 gallons of oil. A medium-oil varnish of 25-gallon length will contain 100 pounds of resin and 25 gallons of oil. A long-oil varnish of 50-gallon length will contain 100 pounds of resin and 50 gallons of oil.

In our discussion, we shall limit ourselves to the pure oil-modified phenolics, oil-modified alkyds, and oil-modified epoxies, because all three give outstanding service as protective coatings for structural steel.

a. Phenolic Paints:

The best grades are made from 100-percent phenol-aldehyde resin-varnishes. These resins are oil-soluble condensation products of certain phenols and formaldehyde. They have outstanding durability due to the resistance of the resin itself, the complex polymer produced by working the resin and oil together, and the tough film resulting from the drying process which depends more on internal polymerization than on external oxidation.

Phenolic paints are excellent for mild chemical exposure at high humidity although their resistance to alkali is poor compared with chlorinated rubber coatings. This is due to their oil content. They have good solvent resistance and their weather resistance in the long-oil types is also good, especially when pigmented with aluminum. In short – to medium-oil lengths they are eminently suitable for quick drying primers and for paints to be submerged in water. Maximum water resistance and maximum exterior durability, however, cannot be achieved at the same time. Since the resins are much more water-resistant than oils, phenolic paints for submersion must be of short- to medium-oil length, which makes them too brittle for outside exposure. On the other hand, exterior durability calls for a paint based on a long-oil varnish, which is unsuitable for total submersion because of the large amount of saponifiable oil present.

If tung oil is used as the sole oil component, even phenolic varnishes of 50-gallon oil length show very good acid-, chemical- and water-resistance. They will have excellent flexibility, although they will not be water resistant enough for constant submersion.

Phenolic paints have poor wetting power, so thorough surface preparation is necessary for best results. Some types become quite hard and insoluble in time. This may give trouble in repainting because the new coat cannot bite into the old one. The addition of strong solvents, such as ketones, to the new paint will overcome this difficulty in most cases. These solvents soften the phenolic coat to be painted over, and so enable the new paint to get the proper bond. Since the phenolic vehicle is dark to start with and turns even darker under exposure, the color retention is not good and they cannot be used in light colors for purely decorative purposes.

b. Alkyd Paints:

Alkyd paints are excellent for the protection of structural steel. They are pigmented alkyd varnishes, consisting of an alkyd resin, a drying oil, volatile thinner and metallic driers.

Alkyd resins are, as the name implies, condensation products of polyhydric alcohols and poly-basic acids. The name really should be alcid, "al" for alcohol and "cid" for acid, but alkyd sounds better and is more easily pronounced. The most common combination is phthalic acid and glycerol. The oil modification consists mainly of linseed oil, soyabean oil and dehydrated castor oil – alone or in mixtures. Since there are many poly-basic acids, poly-hydric alcohols, modifying resins and oils available which can be combined in all proportions, it is evident that an almost unlimited number of oil-modified alkyd varnishes can be produced.

The manufacture of oil-modified alkyd resins is a complicated process because of the many chemical reactions occurring simultaneously in building the complex alkyd molecule. Strict control is necessary to insure complete reaction in the kettle.

As in other oleoresinous varnishes, flexibility and outdoor durability of alkyd varnishes depend to a certain degree on the oil length. There is, however, a fundamental difference. Alkyd resins need much less oil than other resins to obtain durability and elasticity. It is not customary to express the oil length of alkyd varnishes in gallons, usually it is given in percentages of phthalic anhydride and oil. The trade distinguishes between short-, medium-, and long-oil alkyd varnishes which actually contain much less oil than corresponding

short-, medium-, and long-oil varnishes not based on an alkyd resin.

Alkyd paints have outstanding characteristics and alkyds, therefore, are used in larger volume by the coating industry than any other single resin. Oil-modified alkyd paints effectively resist atmospheric attack, and their outdoor durability is superior to other oleoresinous enamels. Their gloss and color retention, even after prolonged outdoor exposure, is remarkable. They retain their flexibility for a very long time. After complete drying, which may take weeks, they are resistant to alcohol, gasoline and lubricating oil. Their acid resistance is sufficient for most atmospheric conditions. Their water resistance is good, but not good enough for submersion. Their alkali resistance is quite low. Alkyd paints of medium-oil length are widely used as primers, as implement and machinery enamels, as garden furniture enamels, and as porch and deck enamels. Long-oil alkyds, with their increased flexibility and exterior durability, make excellent trim enamels and structural steel and marine paints. They are often modified by the addition of linseed oil to increase their flexibility and outdoor durability, especially for wooden surfaces.

c. Epoxy Ester Paints:

Epoxy Resins are condensation products of bisphenol and epichlorohydrin and, therefore, related to the phenolics. They can be used only as baked-on or cold cured air-drying coatings, and will be discussed later.

To utilize epoxy resins in conventional air-drying oleoresinous vehicles, they are reacted with vegetable oil, fatty acid or other organic acids. This reaction is called esterification. Fatty acids. and organic acids generally used in the esterification of epoxy resins are: cocoanut, lauric, linseed, dehydrated castor, soya, tung, rosin and tall oil. The use of more than one type of acid to react simultaneously with the epoxy resin is common practice.

The saponifiable oil in the epoxy ester or varnish is the weak link as far as chemical and water resistance is concerned. The more oil required to impart toughness, flexibility and solubility in weak solvents, the less the chemical- and water-resistance will be. Therefore, the amount and to a much lesser degree, the type of fatty acid used in esterification, governs the properties of the coating. Generally speaking the lower the oil content, the better the adhesion, gloss, hardness, and chemical resistance. At the same time strong aromatic solvents will be needed to keep the epoxy ester resin in solution. The higher the oil content, the better the flow, resistance to sagging, and solubility in weaker solvents. It is often necessary to coreact with rosin to get complete solubility in mineral spirits and a higher alkali resistance. An epoxy ester made with soya will have better color and color retention than an ester made with linseed oil. The initial color and color retention of both types is much better than a phenolic, but inferior to a soyabean alkyd. A general maintenance paint must be non-lifting. That is, it must not lift or wrinkle an old coating to be repainted, and must not lift or wrinkle itself within a reasonable and not too specific drying time between coats. Since only long oil epoxy esters are soluble in weak solvents, it can be readily seen, that the highest chemical resistance an epoxy ester is capable of, cannot be achieved in a non-lifting epoxy ester coating.

Epoxy esters dry thru oxidation of the drying oil component, similar to the drying of alkyds. They are remarkable air-drying coatings, because they combine the excellent adhesion, toughness, abrasion resistance, flexibility, high gloss and durability of an alkyd with a superior chemical and water resistance. However, because of the drying oil present, they do not approach the chemical resistance of the epoxy resin itself. They are also far inferior to chlorinated rubber and vinyl paints in alkali-resistance and for constant submersion. Since extreme chemical resistance is not necessary for most industrial environments, epoxy ester paints can cover a much wider field, than either chlorinated rubber or vinyl, because they are applied as easily as ordinary paint, and can be made non-lifting, which makes painting over old oleoresinous enamel possible.

Epoxy ester paints have one serious drawback. Like all epoxies, they tend to chalk quite early on outdoor exposure. This chalking affects apparently only the upper surface and does not seem to go deep into the film. This is a very peculiar phenomenon. The film does not erode like a free chalking film will, but can be restored by washing to its original gloss and appearance, even after lengthy exposure.

HIGH-POLYMER THERMOPLASTIC PAINTS

a. Chlorinated Rubber Paints:

Unvulcanized natural rubber is not used as a film-forming material because it has too high a viscosity as well as many other shortcomings. Rubber latex must be chemically changed to make it suitable as a base for protective coatings. The best-known modification is the product resulting from its reaction with chlorine: rubber chloride or chlorinated rubber. The high chlorine content of chlorinated rubber is responsible for its non-flammability, acid-, alkali- and water-resistance. But unfortunately it is also responsible for its brittleness, lack of toughness, and poor adhesion. Therefore, chlorinated rubber cannot be used as a sole film-forming binder; its inherent weaknesses call for further modification through the addition of plasticizers and resins. The right modifiers will give chlorinated rubber paints toughness and good adhesion without diminishing their outstanding characteristics: low permeability, high dielectric strength and excellent chemical- and water-resistance. To best handle particular exposures, individual formulations are required. There is no all-purpose chlorinated rubber paint. For instance, a good chlorinated rubber floor enamel does not give the best performance on submerged concrete, nor does a concrete enamel formulated for underwater service make a good floor enamel.

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There are many chlorinated rubber paints on the market which range in their chlorinated rubber content from 5 to 80%. Since all these products can be truthfully called chlorinated rubber paints, the buyer should have some means to distinguish between these different formulations. We are well aware that chlorinated rubber needs additional resins and plasticizers to become a valuable film-forming material, but there is a vast difference between plasticized chlorinated rubber and a mixture of other film formers such as alkyds, varnishes or drying oils with chlorinated rubber. Chlorinated rubber paints which contain at least 60% chlorinated rubber in the vehicle solids and only those resins and plasticizers which do not detract in the least from the chemical-, water- and corrosion-resistance of chlorinated rubber, but rather enhance it, should be called straight chlorinated rubber paints. All others, especially those containing saponifiable matter, should carry the designation "modified chlorinated rubber paints."

Straight chlorinated rubber paints are by far the most satisfactory coatings for interior or exterior surfaces of new or old concrete, submerged or nonsubmerged. The alkalinity of the concrete has no effect whatsoever and the durability of the coating is truly outstanding. They can be used as concrete floor enamels, especially below grade where moisture raised by capillary action saponifies and destroys any coating containing oil. However, as mentioned before, there is no universal formulation for chlorinated rubber coatings. A different formulation is required for submerged concrete surfaces such as the interior of tanks, swimming pools, etc., and nonsubmerged concrete surfaces such as walls and ceilings subjected to extreme condensation and floor surfaces subjected to traffic. What most chlorinated rubber-base coatings have in common is a high resistance to acids, alkalies, salts, alcohol, gasoline and mineral oil. They give a smooth, hard, easily cleaned finish. After drying, they are odorless and tasteless and can therefore be used in contact with drinking water. Chlorinated rubber-base coatings are, however, not resistant to strong acetic acid, animal and vegetable oils, greases and powerful solvents.

Metal, unlike concrete—which is alkaline—does not require special coatings per se. But wherever metal is attacked by chemical fumes, subject to constant condensation, or is totally submerged, chlorinated rubber coatings have an enviable record. Here again, the thickness of the coating is all important. Under identical conditions, the performance of chlorinated rubber paint on metal is in direct proportion to its mil thickness. Five to six mils minimum are necessary for adequate protection. This can be achieved in a four-coat system consisting of one priming coat, two intermediate, and one finish coat. Chlorinated rubber paints applied at a minimum thickness of 5 to 6 mils are excellent for the exterior of process equipment, even where fumes are excessive and splashing and spillage occur frequently.

All chlorinated rubber paints, if they are not modified with oxydizing materials, dry by evaporation only. They behave like lacquers and are soluble in their own solvents, even when dry. Therefore, the second coat will soften the first coat and if the first coat does not have ample drying time, it will be redissolved rather than softened, causing sagging and "curtaining." So, in two- or three-coat applications, the top coats must be laid on easy without brushing back and forth.

Chlorinated rubber paints should be used as a system because of problems of compatibility. As a rule, they cannot be safely applied over oil paints or over oleoresinous enamels, which dry by oxidation. An oxidized film becomes insoluble enough not to be softened by weak solvents such as mineral spirits or turpentine, but will be attacked by the strong solvents like xylol, contained in a chlorinated rubber paint. Any powerful solvent will soften, swell, wrinkle and lift an oxydized film. In other words, it will act as a paint remover. Old oxidized films, especially when they are weathered and flat, can often be painted over with chlorinated rubber paints without trouble. However, a lifting test is always advisable.

When chlorinated rubber paints are used on bare concrete, they are applied much the same as vinyls; however, when applied to bare steel, preparation is not so critical as with a vinyl system, if the right kind of primer is used.

Drying time can be regulated by the choice of solvents; a very important factor in cases where the interruption of plant operation must be held to a minimum.

The application of chlorinated rubber paints is a little more difficult and needs more skill than the application of oleoresinous enamels; but, by following the directions of the manufacturer, any painter can quickly learn to apply these fast-drying coatings successfully. As with any paint containing aromatic solvents, adequate ventilation must be provided in painting confined spaces.

b. Butadiene-Styrene Paints:

Butadiene-styrenes are copolymer resins, soluble in solvents of medium strength. Their compatability with other film formers is poor and they require only a small amount of plasticizer. Paints based on these resins are true lacquers, dry by evaporation only, and show good acid-, alkali-, alcohol-, mineral oil- and water-resistance. Their resistance to vegetable or animal oil and fat is fair, but much better than that of chlorinated rubber. Their water resistance, however, is inferior, and they are not so suitable as chlorinated rubber paints for total submersion.

Highly pigmented, flat butadiene-styrene paints for masonry show very good outdoor durability; in gloss formulations, however, their exterior durability is limited.

Butadiene-styrene copolymers are not chlorinated resins, therefore, their heat resistance is good up to 300 degrees Fahrenheit. For the same reason, they are flammable, and the paints made from them will not be fire-retardant.

They make excellent concrete floor enamels of about the same wearing quality as chlorinated rubber floor enamels. They are, however, inferior in outdoor durability and gasoline resistance, but on the other hand, superior in fat resistance. They utilize much weaker solvents than chlorinated rubber, and almost any aged paint can be painted over with butadiene-styrene paints without lifting.

c. Styrene-Acrylate Paints

They are similar to butadiene-styrene paints but superior in water resistance, color retention and outdoor durability.

d. Vinyl Paints:

Vinyl paints are pigmented vinyl lacquers. Although many synthetic resins contain the active vinyl group $CH_2 = CHX$, only those which are based on vinyl copolymer resins will be discussed in this paper and referred to as vinyls.

Vinyl copolymer resins are produced by polymerizing a mixture of vinyl chloride and vinyl acetate under closely controlled conditions. Of the many possible combinations, the vinyl copolymer best suited for surface coatings contains about 87% vinyl chloride. However, the bond of this vinyl resin on bare steel in air-drying coatings is insufficient and it needs a slight modification with maleic or other organic acids to make it adhere. Another modification with hydroxyl groups is necessary to make it adhere to a vinyl butyral-phosphoric acid wash primer. This hydroxyl modification also makes this resin more compatible with other film formers.

The unmodified vinyl copolymers of different viscosities and different molecular weight and the two modifications mentioned above make it possible for the protective coating industry to utilize these unique resins in outstanding air-drying coating systems.

Vinyl copolymer resins are soluble only in strong solvents such as ketones. Due to their high viscosity, only solutions of low-solid content can be prepared. Pigmentation consists almost exclusively of prime pigments of high hiding power. Properly formulated vinyl paints, after drying, are odorless, tasteless, nontoxic and nonflammable. They have good flexibility, abrasion- and weather-resistance, and are not attacked by mineral acids, alkalies or most chemicals. Their resistance to oils, fats and waxes of mineral, vegetable or animal origin is good. They are not dissolved or softened by alcohols and petroleum solvents. Their dielectric properties are very good, and their permeability is extremely low. They show poor resistance against formic, acetic and other organic acids, especially in higher concentrations, also ammonium hydroxide, phenols and strong solvents. They are true lacquer types and dry by evaporation only. Their fast-drying properties make application by brush quite difficult, so that spraying is preferred. However, with a little experience and technique, brushing is also possible. The low-solids content of 10 to 20% yields only films of low build, and multiple coatings are needed to achieve a satisfactory mil thickness. If maximum film thickness with a minimum number of coats is desired, a semi-liquid vinyl paint can be applied with the help of heat, the so-called hot-spray type.

There are now vinyl resins of much lower viscosity available, which make it possible to obtain high build coatings with a minimum number of coats.

Vinyl resins for surface coatings need very little if any plasticizer because they are inherently tough and flexible. They have, with the exception of the hydroxyl modified vinyl, very low compatibility with other film forming resins, and since any combination with other compounds will detract seriously from their chemical resistance, unmodified vinyl systems are the best. Here they differ from chlorinated rubber coatings which need these modifications to give the best performance.

Vinyl resins of different molecular weight and different modification have individual characteristics which allow the skilled formulator to select the right type or the right blend of vinyl resins for each surface and specific exposure condition.

Vinyl resin paints find their use in industrial applications where their inertness is of special value. Tanks, pipelines, sucker rods, well heads, offshore drilling rigs and numerous other structures and equipment used by the oil industry are protected with vinyl coatings. Railroad hopper cars, dairy and brewery equipment, tanks exposed to acid and alkali spillage, gasoline storage tanks and concrete structures in contact with corrosive fumes or aggressive fluids are also examples of equipment and structures which are successfully protected with vinyl paints. The toughness, abrasion-resistance, low water permeability, high electrolytic-resistance and drying speed make vinyl coatings eminently suitable for roller and tainter gates on hydraulic structures. This was shown by their good performance on the Mississippi River locks. An interesting application of vinyl resins, which takes advantage of the poor adhesion of some members of this family, is found in the strippable coating which can be peeled off the surface when its protection is no longer needed.

Even though vinyls are unique in many respects, they are inferior to chlorinated rubber coatings as general plant maintenance paints for the following reasons: To get the most benefit out of vinyls, they must be applied to sandblasted surfaces by skilled painters, under close supervision. Chlorinated rubber paints, on the other hand, are not nearly so sensitive to surface preparation, and can be applied by unskilled labor. The quick-drying property of vinyls as a rule call for spray application, which is not always feasible. The strong ketone smell, which is very annoying to the painter is another objection. Their resistance to chemicals is about the same as that of chlorinated rubber, with the exception of fatty oils and aviation gasoline where vinyl paints are definitely superior.

e. Modified Vinylidene Chloride Copolymer Paints:

Modified vinylidene chloride copolymer paints are based on vinylidene chloride-acrylonitrile copolymers. They are not quite as chemical and water resistant as vinyl copolymer paints and are used in the protective coating industry only for special applications; for instance, in the protection of the interior of gasoline storage tanks on Navy ships. These gasoline storage tanks are filled with sea water as ballast when the gasoline has been used up and are subject to heavy corrosion. Vinyl copolymer paints would be just as good as far as protection goes, but since these tanks are also cleaned with hot sea water, vinylidene chloride-acrylonitrile copolymer coatings are used. These can stand this cleaning process, whereas vinyl copolymer paints are quickly destroyed by it.

EPOXY RESIN COATINGS

There are about five different types of epoxy resins available. Only one type is widely used in the protective coating field namely the condensation product of bisphenol A and epichlorohydrin and only this type will be discussed in this paper.

Many variations in molecular weight are possible, depending on the ratio of bisphenol to epichlorohydrin, the temperature and pressure applied during the condensation process and other factors. Epoxy resins of low molecular weight are liquid; at higher molecular weight solids.

Epoxy resins are thermoplastic, and are always used with curing agents, because they themselves have no film forming properties. Since they contain in their structure free epoxy and hydroxyl groups they can be reacted with heat convertible resins, simple amines, polyamines, polyamides, anhydrides and other compounds without formation of by-products. The chemical reaction transforms the epoxy resin, with its low molecular weight, linear structure, and thermoplasticity into a high molecular, cross linked and infusable resin polymer with remarkable properties.

Four types of modified epoxy coatings are of special interest to the protective coating industry:

1. *Epoxy esters, which are reaction products of epoxy resins and fatty acids.*
2. *Cold-cure epoxy compounds, which are combinations of epoxy resins with or without solvents and certain curing compounds.*
3. *Cold cure bituminous-epoxy compounds, which are combinations of bitumen, epoxy resins with or without solvent, and certain curing compounds.*
4. *High-bake epoxy compounds, which are mixtures of epoxy resins and heat convertible resins.*

Regarding Type 1, epoxy esters have already been discussed under air drying oleoresinous paints.

Regarding Type 2, cold-cure epoxy compounds are one of the most interesting protective coating systems. Here is a combination, which cures at room temperature, handles like any air-drying paint, and reaches almost the chemical resistance of a baked-on coating. The films are extremely tough, hard, and acid, alkali, chemical, detergent, solvent and water-resistant. Electrical properties are outstanding.

Since they cure by internal linkage only, and do not need oxygen from the air to set, fairly heavy mil thicknesses can be achieved in single applications. It is a two-package system with limited potlife after mixing. Component One contains the epoxy resin (clear or pigmented) and component two contains the curing agent (clear or pigmented) which is mixed with component One prior to application. The potlife after mixing depends on the selection of solvents, curing agent, and storage temperature. Therefore only enough material should be mixed to take care of the immediate need. At lower than room temperature, their curing is delayed; i.e. at 35°F the curing may take weeks. However, there are curing compounds available which will promote fast curing at lower temperature for certain very specific applications. The curing proceeds rapidly at first. It then slows down so that maximum adhesion and chemical resistance are not reached, before the coating has been cured from one to two weeks. To speed up the curing these coatings may be force-dried for 90 minutes at 140°F or for 10 minutes at 200°F.

Optimum results with conventionally cured epoxy coatings can only be realized if a proper sweating time or induction period is observed, after the two components have been thoroughly mixed. The sweating time is usually one hour. This is most important for epoxy coatings to be submerged in water.

The two curing agents, which are widely used, are polyamines and polyamides. Only small amounts of polyamines are needed to crosslink the epoxy resin, which makes accurate proportioning difficult, and they contribute little else to the properties of the cured system. Polyamines are relatively toxic, dermatitic on prolonged contact with the skin and are sensitive to high humidity. They can be used as is or in the form of amine adducts, which are made by adding an excess of amine to epoxy resins, leaving unreacted amine groups available. Amine adducts reduce cratering and blushing, are less sensitive to low temperatures or high humidity and show improved water and chemical resistance. The amount used is also not as critical and their toxic and dermatitic effect is much reduced in comparison with straight polyamines.

Polyamide compounds are the most popular curing agents for epoxy resins used in maintenance paints. They are manufactured by reacting polyamines with dimerized linoleic acids leaving free reactive amine groups along the chain. These polyamides, since they are used in large proportions, have a profound effect on the cured system, acting as a combination of hardener and plasticizer. They increase the potlife of the mixture and are relatively non-toxic and non-dermatitic.

Generally speaking polyamine cured epoxies have the highest chemical and solvent resistance and outstanding hardness. The polyamide cured epoxy resins have a greater degree of initial flexibility, better adhesion, better weatherability, better gloss retention, better blush resistance, better water resistance, but lower solvent resistance and slightly lower chemical resistance.

Polyamide curing compounds are excellent wetting agents and show even some rust-inhibitive properties, which makes it possible to paint wet and rusty surfaces and still get firmly adhering films. Loose rust of course must be removed. The coat in direct contact with the wet surface must be brushed and rubbed in, and cannot be sprayed. Amine cure epoxies do not have this characteristic.

Polysulfides like Thiokol® which bear terminal SH groups, react with epoxy resins, although slowly at room temperature. After addition of a booster, to speed up the curing, they can produce extremely flexible and impact resistant coatings. Chemical resistance is inferior, color retention very poor and they have a very unpleasant sulfide odor.

Most epoxy coatings used in industry are of the solution type. However solventless coatings made from very low viscosity liquid epoxy resins, with or without reactive diluents, are becoming more popular, although they have some very serious shortcomings, i. e. the potlife with conventional curing agents is short and liquid epoxies

are very brittle when cured. There are newer curing agents available, which lengthen the potlife for certain applications. They can be built up to a heavy film in a single coat, and since no solvents are released, there are no minute pinholes and passageways present in the film. Further, they are extensively used as a flooring compound or concrete substitute by mixing with sand aggregate. This type of coatings has found use in dairies, breweries, chemical plants, orange juice or pineapple canneries and other areas where concrete must be protected against chemical attack. It is also used in patching concrete, to fill up cracks in masonry, to cement concrete blocks and in general maintenance repair work.

A very interesting coating is a silica and asbestos filled liquid epoxy cured with a polyamide. It can be applied to wet submerged surfaces, and will cure under water. It is useful for application to concrete draining ditches, bridge abutments, bulkheads, drilling rigs especially on the splash zone and to other structures. The surface must be thoroughly cleaned by sandblasting underwater. The material can be applied by hand, trowel or putty knife. Thickness should be 100 to 120 mils.

Solid epoxies need more solvents than liquid medium viscosity epoxies to make them brushable. The more solvent needed the lower will be the non-volatile volume and correspondingly the mil thickness. Therefore in a *glossy* epoxy paint made from a solid high molecular resin, the thickness of a brush applied coat will usually not exceed 1.3 mils, whereas it will be easy to achieve 2 mils with a coating made from a liquid epoxy of medium viscosity. Mil thickness higher than 2 mils in one coat is dangerous in solvent type epoxy coatings, because solvent retention may under certain conditions cause shrinkage and peeling after curing.

The cold-cure epoxy compounds find wide application where the resistance of baked-on coatings is desired, but the facilities for baking are lacking, or where the structures involved do not lend themselves to the baking process. Ferrous or non-ferrous metal, concrete or wood can be protected with this unique system, which combines excellent adhesion with very good abrasion and impact resistance (floor enamels) and shows at the same time outstanding durability in extremely corrosive and humid atmosphere.

Regarding type 3, cold cure bituminous epoxy compounds are combinations of coal tar or asphalt, epoxy resins, with or without solvents, and certain curing compounds. They may be filled with inert extenders like talc, or compounded with aggregates into heavy mortars.

Coal tar epoxies combine the best features of coal tar and epoxy resins. By combining coal tar with epoxy, not only the quality of the coal tar is improved, but also the quality of the epoxy resin. Not only does the addition of coal tar cut the price of the coating compared to a straight epoxy, but also improves the water resistance tremendously. Coal tar on the other hand is upgraded by the addition of epoxy, because it improves the thermoplasticity of the pitch (no running at higher temperatures), betters the weather resistance (no alligatoring) and gives the coal tar pitch resistance to vegetable oils, animal fats, grease and detergents; features badly lacking in straight coal tar pitch.

The right coal tar pitch has to be selected, because some coal tar pitches do react with epoxy resins, and cause a definite increase in the viscosity of the mixture, which not only makes the mixture unworkable, but also prevents the epoxy groups from reacting with the curing agent. The proportion of coal tar pitch to epoxy may vary from 50% coal tar pitch and 50% epoxy resin to 70% coal tar pitch and 30% epoxy resin. The addition of coal tar pitch to epoxy resin does slow down the curing, especially at lower temperatures.

The curing agent may be a polyamine or polyamide or a combination of both. Polyamide curing agents will give a more flexible film.

Coal tar epoxies can be applied in a single coat to a dry film thickness of 5 to 15 mils. To prevent holidays a minimum of 2 coats is needed. They have excellent adhesion, even at this one coat thickness, in contrast to other epoxy coatings. The abrasion resistance is very good. The impact resistance initially is very good, but decreases on aging. The resistance to acids, alkalies, fresh water, salt water, brine solutions, crude oil, H_2S, vegetable oils, animal fats, grease and detergents, and petroleum products is good to excellent. They are resistant to soil stresses and soil acids. Resistance to aromatic and other strong solvents is only fair to poor.

They stand weathering very well, but coal tar epoxies sometimes turn brown shortly after application. This phenomenon is presumably due to the varying degrees of humidity, but has no bearing on the protective qualities of the material. Continuous exposure to dry heat of 200 to 250°F causes severe embrittlement.

Recoating often presents problems, because an additional coat will not bond well to a fully cured substrate. The second coat must be applied within 48 hours or delamination may occur. At high temperatures around 90 to 100°F the recoating time is much shortened, and sometimes cannot exceed 4 to 6 hours. As a general rule, whenever the coating has cured, the surface must be treated with a special solvent before recoating, to prevent delamination.

Coal tar epoxies are extremely durable coatings for protecting concrete and metal, submerged or non-submerged, against severe corrosive action. They are used to protect the interior and exterior of pipes, the structures and plant equipment of sewage plants, steel sheet pilings, cooling towers and other structures too numerous to mention.

Most coal tar epoxies should not be used for structures coming in contact with potable water, especially if the water stays in lengthy contact with the coating. However they can be used wherever the painted area is small in relation to the volume of water, and where there will be a constant fairly rapid flow of water—such as wash water troughs, machinery, valves, drums, etc.

Asphalt epoxies have all the good features of coal tar epoxies and are handled the same way. They are superior to coal tar epoxies in retaining their flexibility longer, and since they do not give any taste or odor to water they can be used on structures coming in contact with potable water. Chalking on outside exposure is more pronounced (the black color changes to a pleasing grey) which however does not interfere with the performance of the coating. Since epoxy resins are more com-

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patible with coal tar pitch, than with asphalt, the right type of epoxy resin and the right type of asphalt must be selected.

Regarding Type 4, high-bake epoxy compounds are blends of epoxy resins with heat convertible resins. Here we are only interested in the epoxy-phenol formaldehyde combination.

If a coating is desired, which has excellent chemical and solvent resistance, and is at the same time hard, tough and flexible, a high-baked epoxy phenolic system should be chosen. Single or multiple coatings can be applied. Baking temperatures vary between 300 and 400°F and the recommendations of the manufacturer should be strictly followed.

The high-baked epoxy phenolic coating can be used for lining cans, drums, storage tanks, tank cars, processing equipment and numerous other items, which require the unusual combination of resistance and flexibility, which these finishes provide.

HYPALON COATINGS

Hypolon is chlorosulfonated polyethylene, which can be vulcanized into an elastomer by compounding with curing agents and accelerators. They have excellent chemical resistance and weather resistance but are hardly ever used as maintenance coatings.

POLYESTER COATINGS

Polyesters are reactive products formed by the condensation of polybasic and monobasic acids with polyhydric alcohols. To cure they need a catalyst and accelerator. They can be applied in thick films with no loss of volatile solvents, because the solvent used is co-reacted.

Polyester coatings are hard and glossy with good acid and solvent resistance. The alkali resistance is poor. The room cured polyester paints shrink, which may lead to cracking and checking. To overcome this they are often reinforced with glass fiber or chopped glass. They are not normally used as maintenance coatings, but have been applied sucessfully as tank linings and on ship bottoms.

POLYURETHANE COATINGS

Urethane prepolymers contain isocyanate (-NCO) groups which react even without catalysts with any active hydrogen group (-H). The hydrogen group may be present as hydroxyl (-OH) or amine ($-NH_2$). Water also contains such a group (HOH) and will react with the (NCO) group. Therefore in manufacturing, handling and repackaging polyurethane coatings extreme precautions have to be taken to exclude all moisture. The only exception is the oil-modified one-component system which does not contain any reactive groups.

In addition urethane prepolymers contain small amounts of tolylene di-isocyanate (TDI). TDI is considered toxic and is very irritating to the respiratory system. Adequate ventilation must therefore be maintained at all times. Since TDI reacts very fast with the curing agent, the danger of having TDI vapors in the air is markedly less after the two components have been mixed together.

Three types of polyurethane coatings are presently used as maintenance paints:

1. *The one package oil-modified type*
2. *The one package moisture-cured type*
3. *The two package polyol-cured type*

Regarding type 1, oil-modified polyurethanes are reaction products of a polyisocyanate and a polyhydric alcohol ester of vegetable oil acids. They do not contain free isocyanate groups. They are similar to alkyds but slightly superior to alkyds in drying speed, abrasion resistance and water and chemical resistance. Color retention is inferior.

Regarding type 2, moisture-cured polyurethanes are polyurethane prepolymers containing free isocyanate groups which react with ambient moisture. Since no separate catalyst is needed for a full cure (only moisture from the air) this one-can system is becoming very popular because it combines the convenience of a one-package coating with the outstanding properties of a two component polyurethane system. Curing difficulties may arise at very low humidity. In this case the coating has to be used as a two component system by the addition of a catalyst. These conditions however are unusual. There are different moisture-cured types available depending on their end use. Their greatest consumption is in clear coatings for gymnasium floors, bowling alleys and other concrete and hardwood floors subject to excessive traffic. In this field they have found ready acceptance due to their superior performance and their use is growing rapidly. Other interesting applications are: a clear coating for plywood concrete forms and a nonslip, nonabrasive aircraft carrier flight deck coating, which is a combination of moisture-cured polyurethane, asbestos and ground glass. Pigmentation of the one package moisture-cured type is difficult due to the water sensitivity of the vehicle. Even very small amounts of moisture may start a reaction in the can and lead to gelling.

Regarding type 3, the polyol cured polyurethanes are two component systems. Component I contains the polyisocyanate resin, usually a urethane prepolymer isocyanate adduct. Component II consists of hydroxyl-bearing materials such as polyesters, polyethers, castor oil and its derivatives which react with the urethane prepolymers by crosslinking. Component II may be pigmented with commonly used pigments and since the hydroxyl-bearing components are not water sensitive, storage life is not a problem. However, excessive moisture present in Component II will lead to gassing, bubbling, pinholing and a shorter pot life when mixed with the water sensitive Component I.

Depending on the type and the amount of the hydroxyl-bearing component used the film properties vary greatly. Extremely hard and glass-like coatings down to soft and rubber-like elastomers can be produced. The chemical resistance of most types is very good. The alkali resistance is however inferior to cured epoxies. The solvent resistance of certain types is better and it has been reported that they retain their flexibility on outdoor exposure longer than cured epoxies. All polyurethane coatings show very early chalking on outdoor exposure.

NEOPRENE COATINGS

Neoprenes are synthetic rubbers based on chloroprene. Coatings made from neoprene are flexible, resist heat up to 200 degrees Fahrenheit, and show good resistance to acids, alkalies, oils, and aliphatic solvents. They are softened and weakened by strong solvents, and their outdoor durability is only fair. Two types are currently available: One type needs the admixture of accelerating and vulcanizing agents prior to application, while another type cures without any further addition but needs about two weeks to achieve maximum resistance. The main advantage of neoprene coatings lies in the combination of good all-around chemical resistance and high build achieved with a few coats.

FURANE COATINGS

Furanes are condensation products of furfuryl alcohol and formaldehyde. To form a film at room temperature, they have to be catalyzed, but they may also be baked on without a catalyst. Their resistance to acids and solvents is very good, but their resistance to alkalies is only fair. They furnish only a thin paint film which has to be built up to the required mil thickness by applying many coats. This makes the cost per square foot very high.

SILICONE PAINTS

Silicone resins are inorganic silicone-oxygen compounds modified with organic groups and are available in many different types.

Varnishes and paints made from these silicone resins show a much greater heat resistance and better color retention at high temperatures than those made from other organic resins and oils. In the coating industry, they are mainly used as baked-on high temperature colored enamels, which show good color retention up to 450 degrees Fahrenheit. They are also used as electrical insulating varnishes which are far superior to conventional types.

As general maintenance coatings, the price of straight silicone paints is prohibitive and their use is limited to high-heat aluminum paints for boiler stacks, etc., and to colorless water repellent coatings for exterior aboveground masonry.

Certain silicone resins are compatible with alkyds. Silicone modified alkyds show improved heat resistance, weather resistance, mar resistance and chalk resistance.

They are costlier than straight alkyd enamels, the price varying with the amount of silicone resin present.

High-heat aluminum paints based on silicone resins have their limitations. While they do withstand higher temperatures than other high-heat aluminum paints, they also lose their resins by decomposition between 600 and 800 degrees Fahrenheit, and no truly protective film is left above 700 degrees Fahrenheit. Their value for outside exposure in humid atmosphere at such temperatures is, therefore, very doubtful. It stands to reason that the layers of aluminum flakes which are left after the decomposition of the resin and which adhere only mechanically to the steel surface without any binder between them, will not prevent the metal from rusting under atmospheric conditions for any length of time. Inorganic zinc silicates perform much better at very high temperatures.

On the other hand, colorless masonry coatings based on special silicons are of real value. By chemical reaction, they form a silicone resin right on the capillary walls within masonry, making it water repellent. For instance, efflorescence on bricks can be almost wholly prevented by coating them with a silicone product which stops the water from entering the bricks and leaching out soluble salts. These salts, when brought to the surface, crystallize out, forming the well-known unsightly whitish deposit called efflorescence

GREASE COATINGS

Grease coatings are soft petroleum compounds made rust-inhibitive through the addition of certain oils and chemicals. Grease coatings give excellent protection to metal above and below water. Due to their nondrying properties, they differ in many respects from conventional paint systems. Obviously, they are not suitable for surfaces on which a nondrying heavy grease film would be objectionable.

It is not necessary to prepare the surface as thoroughly as for a drying paint, because the grease has a tendency to penetrate existing rust, to work under rust scales down to the bare metal and prevent further corrosion. Application is very simple and does not require skilled labor. Heavy layers of rust can be removed by the application of grease coatings, because the rust will be softened and loosened enough to be easily removed by scraping. A fresh coat of grease is then applied to make a perfect job.

Grease coatings are self-healing; any damage by scratching is obliterated by the grease flowing together due to its soft plastic nature. They are very economical and should be used much more for inexpensive and efficient protection of metal wherever their lack of abrasion resistance is not important.

EMULSION PAINTS

Emulsions are minute particles of a liquid mechanically dispersed in another liquid in which they are not soluble. They fall under the broader classification of suspensions which also include the dispersion of minute particles of solid substances in a liquid. If the liquid or solid particles dispersed in another liquid are so small that they do not separate or settle out and cannot be isolated by filtration, they are known as colloidal suspensions. If we go a step further and look at suspensions where the liquid or solid particles are divided down to atoms or molecules, we arrive at true solutions. One can readily see it is only a matter of particle size.

Since an emulsion, according to definition, is the dispersion of two immiscible liquids, a dispersion of a solid substance in a liquid should not be called an emulsion but a suspension. However, in practice the paint industry calls any dispersion of film-forming substances in water an emulsion whether this substance is a liquid such as a drying oil or a solid such as latex resin or coal-tar

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pitch. In a very broad sense, emulsion paints can therefore be called pigmented dispersions of water-insoluble film-forming substances in water. The dispersion or mechanical breakdown of the particle size is achieved through high-speed agitation or by grinding in a colloid mill or homogenizer. The resultant emulsion is not stable, and to prevent the running together of the minute particles, an emulsifying agent is introduced during the process of emulsification which acts at the interphase between the binder and the water to form a sort of a bridge or connecting link.

When an emulsion paint dries or sets, the water which forms the external phase evaporates. This causes the binder particles, which had been separated by the water, to flow together and form a film. This film is more porous than a film laid down from a solution type paint, because the dispersed particles do not coalesce 100%. In masonry coatings, this feature makes the paint film breathing and is, therefore, desirable. As a true protective coating, however, the emulsion must either contain some high-boiling solvents which remain in the film after evaporation of the water to flow the binder phase into a continuous film, or the film after setting must be exposed to heat to melt the particles together. In bituminous emulsions, protection is achieved by applying very heavily pigmented coatings of great film thickness.

The main advantages of emulsion paints are as follows:

a. *Irritating solvents are eliminated—an important factor in closed-in areas with insufficient ventilation.*
b. *Water can be used as thinner, since water surrounds each binder particle forming the external phase.*
c. *Fire hazards during application are removed.*
d. *Drying is very fast. Moist surfaces can be painted since water is the diluent.*
e. *The large particle size or the dispersed binder prevents penetration of porous surfaces which, therefore, can be sealed uniformly with a minimum of coats.*

The main disadvantages of emulsion paints are:

a. *Inferior storage stability.*
b. *Sensitivity to heat or cold (repeated freezing will destroy most emulsions).*
c. *Reduced protective qualities.*

With the exception of bituminous emulsions, which have been discussed elsewhere, emulsion paints are used mainly as maintenance paints for interior non-metal surfaces. However, emulsion paints for exterior masonry surfaces are now manufactured, which have excellent outdoor durability.

New emulsion resins have been recently developed, which can be used as protective coatings on metal. Their ultimate durability however has not yet been established.

Emulsion paint primers, which are noninflammable, are widely used in the automobile industry.

Most of the emulsion paints today are of the synthetic resin type, with styrene butadiene latex, polystyrene latex, poly-vinyl-acetate acrylics, and combinations of these resins furnishing the bulk of the resins used.

GENERAL RESISTANCE CHART

	Water Resistance	Chemical Resistance	Weather Resistance	Abrasion Resistance
Alkyd	5	4	8	8
Epoxy Ester	5	6	6	8
Epoxy Amine Cured	8	8	6	10
Epoxy Amide Cured	8	8	6	10
Epoxy Coal Tar	10	8	6	9
Epoxy Asphalt	10	8	7	8
Vinyl System	10	8	8	6
Chlorinated Rubber System	10	7	8	6
Asphalt	10	6	6	4
Coal Tar Pitch	10	6	6	4

Ratings are graduated downward with 10 being best.

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CHEMICAL RESISTANCE CHART

This chart supplies only approximate data because of the variability of test results. Further, it assumes normal ambient temperature exposures. Where complete submersion in very aggresive chemicals is required, additional submersion tests under actual conditions should be performed. Generally for complete submersion in very aggressive liquids, a liner should be first choice. If a coating must be used, several coats should be applied to a dry mil thickness of twenty (20) or more. The properties of any protective coating system will vary considerably depending on the formulation and/or selection of the primer, intermediate and final coats.

	Alkyd	Epoxy Ester	Epoxy Amine Cured	Epoxy Amide Cured	Epoxy Coal Tar	Epoxy Asphalt	Vinyl System	Chlorinated Rubber System	Asphalt	Coal Tar Pitch
Acetic Acid 2%	D	C	B	B	B	B	B	C	C	C
Alcohol Amyl	D	D	B	B	B	B	C	C	C	C
Alcohol Butyl	D	C	B	B	B	B	B	B	C	C
Alcohol Ethyl	B	B	A	A	A	A	A	A	B	B
Alcohol Isopropyl	B	B	A	A	A	A	A	A	B	B
Alcohol Methyl	B	B	A	A	A	A	A	A	B	B
Aluminum Chloride	D	D	B	B	B	B	A	C	C	C
Aluminum Sulfate	D	D	B	B	A	A	A	B	B	B
Ammonium Chloride	D	D	B	B	A	A	A	C	C	B
Ammonium Hydroxide	NS	D	B	C	B	B	B	C	C	C
Ammonium Nitrate	D	C	B	B	A	A	A	C	B	B
Ammonium Phosphate 10%	NS	D	B	B	B	B	B	C	B	B
Ammonium Sulfate	D	D	B	B	A	A	A	C	B	B
Bleach; Compound	D	D	C	C	B	B	B	C	D	D
Calcium Chloride	C	B	B	B	A	A	A	B	B	B
Calcium Hydroxide	NS	NS	B	B	A	A	B	B	B	B
Calcium Hypochlorite	NS	NS	B	B	B	B	A	B	C	C
Chlorine Gas	NS	NS	D	D	X	X	B	C	D	D
Chromic Acid 10%	NS	NS	C	C	C	C	B	D	D	D
Chromic Acid 60%	NS	NS	C	C	C	C	B	D	D	D
Citric Acid	C	B	B	B	A	A	A	B	C	C
Esters	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Ethers	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Fats	X	X	B	X	X	X	B	NS	NS	NS
Ferric Chloride	D	C	B	B	A	A	A	B	C	C
Formaldehyde 40%	D	D	B	B	B	B	B	B	D	D
Formic Acid 20%	D	D	B	B	A	A	NS	B	D	D
Formic Acid Conc.	NS	NS	B	B	B	B	NS	B	D	D
Gasoline	C	B	A	B	B	B	A	D	NS	D
Glycols	B	B	B	B	B	B	B	B	B	B
Hydrochloric Acid 10%	D	C	B	B	B	B	B	C	C	D
Hydrochloric Acid 30%	NS	NS	B	B	B	B	B	C	C	D
Hydrochloric Acid Conc.	NS	NS	B	B	B	B	B	C	C	D
Hydrofluoric Acid 10%	D	D	B	B	B	B	NS	B	X	X
Hydrofluoric Acid 40%	NS	NS	B	B	B	B	NS	B	X	X
Hydrofluoric Acid 75%	NS	NS	B	B	B	B	NS	B	X	X
Hydrogen Peroxide 3%	D	D	B	B	B	B	A	C	X	X
Hydrogen Peroxide 30%	D	D	B	B	B	B	B	C	X	X
Hydrogen Sulfide	D	C	B	B	A	A	A	B	B	A
Jet Fuel	X	X	A	B	D	D	A	D	NS	D
Kerosene	B	B	A	B	B	B	A	D	NS	D

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CHEMICAL RESISTANCE CHART

	Alkyd	Epoxy Ester	Epoxy Amine Cured	Epoxy Amide Cured	Epoxy Coal Tar	Epoxy Asphalt	Vinyl System	Chlorinated Rubber System	Asphalt	Coal Tar Pitch
Ketones	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Lactic Acid	NS	D	B	B	B	B	B	B	D	D
Lubricating Oil	B	B	A	B	A	A	A	D	NS	D
Magnesium Sulfate	C	B	B	B	A	A	A	B	B	B
Milk	X	B	B	B	B	B	A	X	X	X
Mineral Oil	B	B	A	B	A	A	A	D	NS	D
Nitric Acid 5%	NS	NS	B	C	B	B	B	C	C	C
Nitric Acid 10%	NS	NS	B	C	B	B	B	C	D	D
Nitric Acid 40%	NS	NS	C	C	C	C	B	D	NS	NS
Nitric Acid Conc.	NS	NS	C	C	NS	NS	B	NS	NS	NS
Oils, Animal & Vegetable	X	X	B	B	X	X	B	NS	NS	NS
Oleic Acid	D	D	B	B	X	X	B	NS	NS	NS
Oxalic Acid	C	B	B	B	A	A	A	B	B	B
Phenol	NS	NS	B	C	X	X	NS	NS	NS	NS
Phosphoric Acid 10%	D	C	B	B	A	A	A	C	C	C
Phosphoric Acid 85%	NS	NS	B	B	B	B	B	C	D	D
Potassium Alum	C	B	B	B	A	A	A	B	B	B
Potassium Hydroxide 20%	NS	NS	B	B	B	B	B	B	D	D
Sodium Carbonate	D	D	B	B	A	A	A	B	D	D
Sodium Chloride	C	B	B	B	A	A	A	A	A	A
Sodium Hydroxide 10%	NS	NS	B	B	A	A	B	B	C	C
Sodium Hydroxide 20%	NS	NS	B	B	A	A	B	B	C	C
Sodium Hydroxide 40%	NS	NS	B	B	B	B	B	B	C	C
Sodium Hypochlorite	NS	NS	C	C	C	C	B	C	NS	NS
Sodium Nitrate	C	B	B	B	A	A	A	B	B	B
Sodium Sulfate	C	B	B	B	A	A	A	B	B	B
Sodium Sulfite	C	B	B	B	A	A	A	B	B	B
Solvents Aliphatic	C	C	B	B	B	B	B	D	NS	D
Solvents Aromatic	NS	NS	B	C	D	D	C	NS	NS	NS
Solvents Chlorinated	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Sour Crude	D	C	B	B	A	A	B	C	D	D
Sugar Liquid	X	B	B	B	B	B	A	B	X	X
Sulfuric Acid 10%	D	C	B	B	B	B	B	B	B	D
Sulfuric Acid 30%	NS	NS	B	B	B	B	B	C	D	D
Sulfuric Acid 60%	NS	NS	C	C	C	C	B	C	NS	NS
Sulfurous Acid 10%	X	X	C	C	B	B	B	C	X	X
Water, Sea	C	B	B	B	A	A	A	A	A	A
Water, Distilled	B	B	B	B	A	A	A	A	A	A
Temperature Resistance, Dry	200°F	200°F	200°F	200°F	200°F	200°F	150°F	140°F	140°F	100°F
Temperature Resistance, Wet	None	None	100°F	100°F	100°F	100°F	100°F	90°F	100°F	90°F

A – Submerged, splash, spillage and fumes
B – Splash, spillage and fumes
C – Fumes
D – Limited recommendation
NS – Not suitable
X – No information

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GLOSSARY OF SOME TECHNICAL TERMS USED IN THE PROTECTIVE COATINGS INDUSTRY

Actinic Rays of the Sun... Those wave lengths of the sun rays which induce or accelerate chemical changes in a paint film.

Aliphatic Solvents... Mild solvents derived from petroleum, such as mineral spirits.

Anode... The positive electrode at which the current enters the solution.

Aromatic Solvents... Strong solvents derived from coal tar and certain petroleum types, such as toluol, xylol, and solvent naphtha.

Cathode... The negative electrode where the current leaves the solution.

Chalking... Loose pigment particles on the surface of a paint film, caused by the gradual destruction of the binding vehicle through light and oxygen.

Copolymer... The polymerization product of two or more different polymers which is not just a mixture, but a new chemical compound with different properties.

Coverage... The hiding power of a paint in terms of square feet per gallon.

Crawling... The contracting and creeping away of a wet paint film forming bare spots on the sub-stratum, due to insufficient adhesion.

Dielectric Strength... The electrical insulating power of a compound.

Efflorescence... The whitish salt deposit on masonry, especially brick, caused by the leaching of water-soluble salts out of the interior of the masonry. When brought to the surface, these salts crystallize out when the water evaporates.

Electrolyte... An aqueous solution which can conduct an electrical current.

Electron... The negative unit of an atom.

Fading... The change in appearance due to the loss of color caused by light, heat or chemical action.

Gel... A colloidal mass with reduced flow.

Holiday... The part of a surface not properly covered by the coating.

Hygroscopic... The ability to absorb and hold moisture.

Inerts... Pigments having little or no hiding power. Used to reinforce the structure of a paint film.

Inhibitor... A compound which restricts chemical reaction, especially corrosion.

Ion... An atom or groups of atoms bearing an electric charge.

Ketones... Very powerful synthetic hydro-carbon solvents used in connection with many plastic resins especially vinyl copolymers.

Lifting... Action of a strong solvent on a film which is not soluble in this solvent but is softened by it, producing wrinkles.

Plasticizer... A compound added to a material to make it more flexible.

Polymerization... The reaction of two or more molecules of the same substance to form new products of higher molecular weight and, therefore, of different properties but without changing the chemical composition. The end product is called a polymer.

Resin... A solid or semi-solid organic compound which is thermoplastic, does not crystallize, is not a conductor of electricity, has no sharp melting point and is soluble in organic solvents but not in water. It originates, in the case of natural resins, from the secretions of certain plants or insects; or, in the case of synthetic resins, through chemical reaction of numerous substances producing complex compounds of higher molecular weight than the original materials.

Rosin... The residue of the distillation of gum spirits of turpentine.

Saponification... The breaking down of an organic fat or oil by water and alkali. This process is used in the manufacture of soap, hence the name.

Thermoplastic... A term describing a solid which upon application of heat, softens and becomes plastic, but which, upon cooling, returns to its original state.

Thixotropic... The property of some gels which are apparently viscous and heavy, but become fluid by shaking or stirring and return slowly to their original rigidity when the disturbance ceases.

Viscosity... The inherent resistance of a liquid to flow, based on the internal friction of the fluid.

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Exhibit 85

State of California Dep...
Sanitation and Radiation Laboratory
Southern California Laboratory

SAMPLE FOR CHEMICAL ANALYSIS

11-16-82 (Date Blank) 1702

Purveyor and Address (include city and county): City of San Bernardino

System Number: B 6 X 0

Serial Number: C 09309

Sampling Point: Mtn. Reservoir

Collected by: R. Hub

Date and Hour Collected: 11/8/82.

Type of Sample: ☐ Raw Surface Water ☒ Drinking Water: ☐ Raw ☐ Treated ☐ Wastewater ☐ Raw ☐ Chlorinated ☐ Trade Waste ☐ Other

Send Report To: ☒ WSS Dist. # S. Bno ☐ County HD ☐ DOT Dist. # ☐ National Park Serv. ☐ RWQCB # ☐ Other

Results are expressed as mg/l unless specified

☐ GENERAL MINERAL ANALYSIS

			(mg/l as $CaCO_3$)
☐ Ca		☐ Hardness	
☐ Mg		☐ HCO_3	
☐ Fe Total		☐ CO_3	
☐ Mn		☐ OH	
☐ Na		☐ Total Alk.	
☐ K		☐ Cl	
☐ pH		☐ SO_4	
☐ Total Dissolved Solids		☐ F	
		☐ NO_3	

TRACE ELEMENTS: ☐ Al ☐ Ag ☐ As ☐ B ☐ Cd ☐ Cr ☐ Cu ☐ Hg ☐ Pb ☐ Ni ☐ Se ☐ Zn ~30 days. ☐

☒ Other analyses desired (specify):

TCE = 1.1 mg/L
PCE = 46 mg/L

3 days retention after >30 days G.A. analysis

Date Reported	Analyst
11-17-82	P.H.

☐ Turb. TU	☐ NH_3-N	☐ BOD	☐ Susp. Solids	☐ PO_4
☐ Spec. Cond. µmhos/cm	☐ ORG-N	☐ Grease	☐ Set Solids ml/l/hour	☐ MBAS

Form LAB-800 (4/74)

United States Summary Judgment Motion Ex. 85, Page 889

State of California · Department of Health
Sanitation and Radiation Laboratory
Southern California Laboratory

SAMPLE FOR CHEMICAL ANALYSIS

12-22-[illegible] (Blank) 8121

Purveyor and Address (include city and county): City of San Bernardino

System Number: 3 6

Serial Number: C 09320

Sampling Point: Mt. Tank 15'

Collected by: R. Huls

Date and Hour Collected: 12/13/82 9:20.

Type of Sample: ☐ Raw Surface Water ☒ Drinking Water: ☐ Raw ☒ Treated ☐ Wastewater ☐ Raw ☐ Chlorinated ☐ Trade Waste ☐ Other

Send Report To: ☒ WSS Dist. # SBdno ☐ County HD ☐ DOT Dist. # ☐ National Park Serv. ☐ RWQCB # ☐ Other

Results are expressed as mg/l unless specified

☐ GENERAL MINERAL ANALYSIS

			(mg/l as Ca CO_3)
☐ Ca		☐ Hardness	
☐ Mg		☐ HCO_3	
☐ Fe Total		☐ CO_3	
☐ Mn		☐ OH	
☐ Na		☐ Total Alk	
☐ K		☐ Cl	
☐ pH		☐ SO_4	
☐ Total Dissolved Solids		☐ F	
		☐ NO_3	

TRACE ELEMENTS: ☐ Al ☐ Ag ☐ As ☐ B ☐ Cd ☐ Cr ☐ Cu ☐ Hg ☐ Pb ☐ Ni ☐ Se ☐ Zn ☐

☒ Other analyses desired (specify):

TCE = 0.75 ug/l (ppb)

PCE = 27.8 "

Date Reported: 12-29-82

Analyst: VT

☐ Turb TU	☐ NH_3-N	☐ BOD	☐ Susp. Solids	☐ PO_4
☐ Spec. Cond μmhos/cm	☐ ORG-N	☐ Grease	☐ Set Solids ml/l/hour	☐ MBAS

Form LAB-800 (4/74)

United States Summary Judgment Motion, Ex. 85, Page 890

State of California Department of Health
Sanitation and Radiation Laboratory
Southern California Laboratory

SAMPLE FOR CHEMICAL ANALYSIS

12-22-8[redacted] (Leave Blank) 8122

Purveyor and Address (include city and county): City of S. Bdno.

System Number: 3 6

Serial Number: C 09319

Sampling Point: Cliffe Mt. Tank 22'

Collected by: R. Hulz

Date and Hour Collected: 12-13-82

Type of Sample: ☐ Raw Surface Water ☐ Wastewater ☐ Drinking Water: ☐ Raw ☐ Treated ☐ Raw ☐ Chlorinated ☐ Trade Waste ☐ Other

Send Report To: ☒ WSS Dist. # S.Bdno ☐ County HD ☐ DOT Dist. # ☐ National Park Serv. ☐ RWQCB # ☐ Other

Results are expressed as mg/l unless specified

☐ GENERAL MINERAL ANALYSIS

☐ Ca		☐ Hardness (mg/l as $CaCO_3$)	
☐ Mg		☐ HCO_3	
☐ Fe Total		☐ CO_3	
☐ Mn		☐ OH	
☐ Na		☐ Total Alk.	
☐ K		☐ Cl	
☐ pH		☐ SO_4	
☐ Total Dissolved Solids		☐ F	
		☐ NO_3	

TRACE ELEMENTS: ☐ Al ☐ Ag ☐ As ☐ B ☐ Cd ☐ Cr ☐ Cu ☐ Hg ☐ Pb ☐ Ni ☐ Se ☐ Zn ☐

☒ Other analyses desired (specify):

TCE = 0.88 ug/l (ppb)
PCE = 21.6 "

Date Reported: 12-29-82

Analyst: VT

☐ Turb TU	☐ NH_3-N	☐ BOD	☐ Susp Solids	☐ PO_4
☐ Spec. Cond. µmhos/cm	☐ ORG-N	☐ Grease	☐ Set Solids ml/l/hour	☐ MBAS

Form LAB-800 (4/74)

United States Summary Judgment Motion, Ex. 85, Page 891

State of California · Department of Health
Sanitation and Radiation Laboratory
Southern California Laboratory

SAMPLE FOR CHEMICAL ANALYSIS

Date Received: 12-22-[redacted] (Leave Blank) 8123

Purveyor and Address (include city and county): City of San Bernardino

System Number: B 6

Serial Number: C 09318

Sampling Point: Mountain Tank 8½'

Collected by: R. Huls

Date and Hour Collected: 12-8-82

Type of Sample: ☐ Raw Surface Water ☒ Drinking Water: ☐ Raw ☒ Treated ☐ Wastewater: ☐ Raw ☒ Chlorinated ☐ Trade Waste ☐ Other

Send Report To: ☒ WSS Dist. # S. Bone ☐ County HD ☐ DOT Dist. # ☐ National Park Serv. ☐ RWQCB # ☐ Other

Results are expressed as mg/l unless specified

GENERAL MINERAL ANALYSIS

		(mg/l as $CaCO_3$)	
☐ Ca		☐ Hardness	
☐ Mg		☐ HCO_3	
☐ Fe Total		☐ CO_3	
☐ Mn		☐ OH	
☐ Na		☐ Total Alk.	
☐ K		☐ Cl	
☐ pH		☐ SO_4	
☐ Total Dissolved Solids		☐ F	
		☐ NO_3	

TRACE ELEMENTS

☐ Al
☐ Ag
☐ As
☐ B
☐ Cd
☐ Cr
☐ Cu
☐ Hg
☐ Pb
☐ Ni
☐ Se
☐ Zn
☐

☒ Other analyses desired (specify):

TCE = 0.99 ug/l (ppb)
PCE = 23.0 "

Date Reported: 12-29-82

Analyst: VT

☐ Turb. TU	☐ NH_3-N	☐ BOD	☐ Susp. Solids	☐ PO_4
☐ Spec. Cond. µmhos/cm	☐ ORG-N	☐ Grease	☐ Set Solids ml/l/hour	☐ MBAS

Form LAB-800 (4/74)

United States Summary Judgment Motion, Ex. 85, Page 892

Sanitation and Radiation Laboratory
Southern California Laboratory
SAMPLE FOR CHEMICAL ANALYSIS

12-22-82 (Date) | Blank) 8124

Purveyor and Address (include city and county): City of San Bernardino

System Number: B b

Serial Number: C 09316

Sampling Point: Mountain Tank 12'

Collected by: R. Huls.

Date and Hour Collected: 12-9-82 9:00

Type of Sample: ☐ Raw Surface Water ☐ Drinking Water ☐ Raw ☐ Treated ☐ Wastewater ☐ Raw ☐ Chlorinated ☐ Trade Waste ☐ Other

Send Report To: ☒ WSS Dist. # 3 Bond ☐ County HD ☐ DOT Dist. # ☐ National Park Serv. ☐ RWQCB # ☐ Other

Results are expressed as mg/l unless specified

☐ GENERAL MINERAL ANALYSIS

☐ Ca		☐ Hardness (mg/l as $CaCO_3$)	
☐ Mg		☐ HCO_3	195
☐ Fe Total		☐ CO_3	
☐ Mn		☐ OH	
☐ Na		☐ Total Alk.	
☐ K		☐ Cl	
☐ pH		☐ SO_4	
☐ Total Dissolved Solids		☐ F	
		☐ NO_3	

TRACE ELEMENTS: ☐ Al ☐ Ag ☐ As ☐ B ☐ Cd ☐ Cr ☐ Cu ☐ Hg ☐ Pb ☐ Ni ☐ Se ☐ Zn ☐

☒ Other analyses desired (specify):

TCE = 0.94 ug/l (ppb)

PCE = 25.3 "

Date Reported: 12-29-82

Analyst: VT

☐ Turb. TU	☐ NH_3-N	☐ BOD	☐ Susp Solids	☐ PO_4
☐ Spec. Cond. µmhos/cm	☐ ORG-N	☐ Grease	☐ Set Solids ml/l/hour	☐ MBAS

Form LAB-800 (4/74)

United States Summary Judgment Motion, Ex. 85, Page 893

State of California Department of Health
Sanitation and Radiation Laboratory
Southern California Laboratory

SAMPLE FOR CHEMICAL ANALYSIS

12-22-8[illegible] [illegible]e Blank) 8120

Purveyor and Address (include city and county): City of San Bernardino

System Number: B 6

Serial Number: C 09317

Sampling Point: Mountain Tank

Collected by: R. Huls

Date and Hour Collected: 12-10-82 9:10

Type of Sample: ☐ Raw Surface Water ☐ Wastewater ☒ Drinking Water: ☐ Raw ☐ Chlorinated ☐ Raw ☐ Trade Waste ☒ Treated ☐ Other

Send Report To: ☒ WSS Dist. # S. Bona ☐ County HD ☐ DOT Dist. # ☐ National Park Serv. ☐ RWQCB # ☐ Other

Results are expressed as mg/l unless specified

☐ GENERAL MINERAL ANALYSIS

			(mg/l as $CaCO_3$)
☒ Ca		☐ Hardness	109
☐ Mg		☐ HCO_3	
☐ Fe Total		☐ CO_3	
☐ Mn		☐ OH	
☐ Na		☐ Total Alk.	
☐ K		☐ Cl	
☐ pH		☐ SO_4	
☐ Total Dissolved Solids		☐ F	
		☐ NO_3	

TRACE ELEMENTS: ☐ Al ☐ Ag ☐ As ☐ B ☐ Cd ☐ Cr ☐ Cu ☐ Hg ☐ Pb ☐ Ni ☐ Se ☐ Zn ☐

☒ Other analyses desired (specify):

TCE = 0.96 ug/l ppb
PCE = 28.9 "

Date Reported: 12-29-82

Analyst: VT

☐ Turb TU	☐ NH_3-N	☐ BOD	☐ Susp Solids	☐ PO_4
☐ Spec. Cond. µmhos/cm	☐ ORG-N	☐ Grease	☐ Set Solids ml/l/hour	☐ MBAS

Form LAB-800 (4/74)

United States Summary Judgment Motion, Ex. 85, Page 894

State of California Department of Health
Sanitation and Radiation Laboratory
Southern California Laboratory

SAMPLE FOR CHEMICAL ANALYSIS

Date Received: 12-22-8[illegible] (Blank) 8/26

Purveyor and Address (include city and county): City of San Bernardino

System Number: 3 6

Serial Number: C 09315

Sampling Point: Mountain Tank 15'

Collected by: R. Huls.

Date and Hour Collected: 12-7-82

Type of Sample: ☐ Raw Surface Water ☐ Wastewater ☒ Drinking Water: ☐ Raw ☐ Chlorinated ☐ Treated ☐ Treated Water ☐ Other

Send Report To: ☒ WSS Dist. # 3.32 No. ☐ County HD ☐ DOT Dist. # ☐ National Park Serv. ☐ RWQCB # ☐ Other

Results are expressed as mg/l unless specified

GENERAL MINERAL ANALYSIS

		(mg/l as Ca CO_3)	
☐ Ca		☐ Hardness	
☐ Mg		☐ HCO_3	
☐ Fe Total		☐ CO_3	
☐ Mn		☐ OH	
☐ Na		☐ Total Alk.	
☐ K		☐ Cl	
☐ pH		☐ SO_4	
☐ Total Dissolved Solids		☐ F	
		☐ NO_3	

TRACE ELEMENTS

☐ Al ☐ Ag ☐ As ☐ B ☐ Cd ☐ Cr ☐ Cu ☐ Hg ☐ Pb ☐ Ni ☐ Se ☐ Zn ☐

☒ Other analyses desired (specify):

TCE = 0.87 ug/l (ppb)

PCE = 28.0 "

Date Reported: 12-29-82

Analyst: VT

☐ Turb. TU	☐ NH_3-N	☐ BOD	☐ Susp. Solids	☐ PO_4
☐ Spec. Cond μmhos/cm	☐ ORG-N	☐ Grease	☐ Set Solids ml/l/hour	☐ MBAS

Form LAB-800 (4/74)

United States Summary Judgment Motion, Ex. 85, Page 895

Sanitation and Radiation Laboratory Section
Southern California Laboratory Section
SAMPLE FOR CHEMICAL ANALYSIS

12-8-82 ve Blank) 0063

Purveyor and Address (include city and co

City of San Bernardino

System Number: 36 0 3 9

Serial Number: C 21588

Sampling Point: Mt. Tank. 14 ft.

Collected by: R. Ehls

Date and Hour Collected: 11-30-82 2115

Type of Sample: ☐ Raw Surface Water ☐ Drinking Water ☐ Raw ☐ Treated ☐ Waste water: ☐ Raw ☐ Chlorinated ☐ Trade Waste ☐ Other

Send Report To: ☒ WSS Dist. # S. Bdno ☐ County HD ☐ DOT Dist. # ☐ National Park Serv. ☐ RWQCB # ☐ Other

Results are expressed as mg/l unless specified

☐ GENERAL MINERAL ANALYSIS

☐ Ca	.	☐ Hardness (mg/l as Ca CO_3)	.
☐ Mg	.	☐ HCO_3	.
☐ Fe Total	.	☐ CO_3	.
☐ Mn	.	☐ OH	.
☐ Na	.	☐ Total Alk.	.
☐ K	.	☐ Cl	.
☐ pH	.	☐ SO_4	.
☐ Total Dissolved Solids		☐ F	.
		☐ NO_3	.

TRACE ELEMENTS

☐ Al
☐ Ag
☐ As
☐ B
☐ Cd
☐ Cr
☐ Cu
☐ Hg
☐ Pb
☐ Ni
☐ Se
☐ Zn
☐

☒ Other analyses desired (specify):

TCE = 2.0 µg/L
PCE = 39 µg/L

Date Reported	Analyst
12-9-82	P.H.

☐ Turb. TU	☐ NH_3-N	☐ BOD	☐ Susp. Solids	☐ PO_4
☐ Spec. Cond. µmhos/cm	☐ ORG-N	☐ Grease	☐ Set Solids ml/l/hour	☐ MBAS

Form LAB-800 (2-80)

United States Summary Judgment Motion, Ex. 85, Page 896

Sanitation and Radiation Laboratory Section
Southern California Laboratory Section
SAMPLE FOR CHEMICAL ANALYSIS

12-8-82 ve Blank) 8061

Purveyor and Address (include city and cou

City of San Bernardino

System Number: 3 6 D 3 9

Serial Number: C 21585

Sampling Point: Mt. Tank. 11 ft.

Collected by: R. Hulls

Date and Hour Collected: 12-3-82 9:25

Type of Sample
- ☐ Raw Surface Water
- ☐ Drinking Water
  - ☐ Raw
  - ☐ Treated
- ☐ Waste water:
  - ☐ Raw ☐ Chlorinated
- ☐ Trade Waste
- ☐ Other

Send Report To
- ☒ WSS Dist. # SBDNO ☐ County HD
- ☐ DOT Dist. # ☐ National Park Serv.
- ☐ RWQCB # ☐ Other

Results are expressed as mg/l unless specified

☐ **GENERAL MINERAL ANALYSIS**

☐ Ca	.	☐ Hardness (mg/las Ca CO_3)	.
☐ Mg	.	☐ HCO_3	.
☐ Fe Total	.	☐ CO_3	.
☐ Mn	.	☐ OH	.
☐ Na	.	☐ Total Alk.	.
☐ K	.	☐ Cl	.
☐ pH	.	☐ SO_4	.
☐ Total Dissolved Solids		☐ F	.
		☐ NO_3	.

TRACE ELEMENTS
- ☐ Al
- ☐ Ag
- ☐ As
- ☐ B
- ☐ Cd
- ☐ Cr
- ☐ Cu
- ☐ Hg
- ☐ Pb
- ☐ Ni
- ☐ Se
- ☐ Zn
- ☐

☒ Other analyses desired (specify):

PCE = 41 µg/l

TCE = 1.6 µg/l

Date Reported	Analyst
12-9-82	P.H.

☐ Turb. TU	☐ NH_3-N	☐ BOD	☐ Susp. Solids	☐ PO_4
☐ Spec. Cond. µ mhos/cm	☐ ORG-N	☐ Grease	☐ Set Solids ml/l/hour	☐ MBAS

Form LAB-800 (2-80)

United States Summary Judgment Motion, Ex. 85, Page 897

State of California · Department of Health Services
Sanitation and Radiation Laboratory Section
Southern California Laboratory Section
SAMPLE FOR CHEMICAL ANALYSIS

Date Received: 12-8-8[illegible]

Lab No. (Blank): 8004

Purveyor and Address (include city and county): City of San Bernardino

System Number: 3 6 X 0 3 9

Serial Number: C 21589

Sampling Point: Mt. Tank 13.5'

Collected by: R. Hulk.

Date and Hour Collected: 12-6-82 1:00 pm

Type of Sample: ☐ Raw Surface Water ☐ Drinking Water ☐ Raw ☐ Treated ☐ Waste water: ☐ Raw ☐ Chlorinated ☐ Trade Waste ☐ Other

Send Report To: ☒ WSS Dist. # San Bdno ☐ County HD ☐ DOT Dist. # ☐ National Park Serv. ☐ RWQCB # ☐ Other

Results are expressed as mg/l unless specified

☐ GENERAL MINERAL ANALYSIS

☐ Ca		☐ Hardness (mg/l as Ca CO_3)	
☐ Mg		☐ HCO_3	
☐ Fe Total		☐ CO_3	
☐ Mn		☐ OH	
☐ Na		☐ Total Alk.	
☐ K		☐ Cl	
☐ pH		☐ SO_4	
☐ Total Dissolved Solids		☐ F	
		☐ NO_3	

TRACE ELEMENTS

☐ Al ☐ Ag ☐ As ☐ B ☐ Cd ☐ Cr ☐ Cu ☐ Hg ☐ Pb ☐ Ni ☐ Se ☐ Zn ☐

☒ Other analyses desired (specify):

TCE = 1.5 µg/L

PCE = 32 µg/L

Date Reported	Analyst
12-9-82	P.A.

☐ Turb. TU	☐ NH_3-N	☐ BOD	☐ Susp. Solids	☐ PO_4
☐ Spec. Cond. µmhos/cm	☐ ORG-N	☐ Grease	☐ Set Solids ml/l/hour	☐ MBAS

Form LAB-800 (2-80)

United States Summary Judgment Motion, Ex. 85, Page 898

Sanitation and Radiation Laboratory Section
Southern California Laboratory Section
SAMPLE FOR CHEMICAL ANALYSIS

10/15/8[illegible] ve Blank) 7636

Purveyor and Address (include city and cou[illegible]: City of San Bernardino

System Number: 36

Serial Number: C 24599

Sampling Point: Del Rosa No. 3 -

Collected by: R Hulls

Date and Hour Collected: 10/1/82

Type of Sample
- ☐ Raw Surface Water
- ☒ Drinking Water
  - ☒ Raw
  - ☐ Treated
- ☐ Waste water:
  - ☐ Raw ☐ Chlorinated
- ☐ Trade Waste
- ☐ Other

Send Report To
- ☒ WSS Dist. # S Bdno
- ☐ County HD
- ☐ DOT Dist. #
- ☐ National Park Serv.
- ☐ RWQCB #
- ☐ Other

Results are expressed as mg/l unless specified

☐ **GENERAL MINERAL ANALYSIS**

☐ Ca		☐ Hardness (mg/l as Ca CO_3)	
☐ Mg		☐ HCO_3	
☐ Fe Total		☐ CO_3	
☐ Mn		☐ OH	
☐ Na		☐ Total Alk.	
☐ K		☐ Cl	
☐ pH		☐ SO_4	
☐ Total Dissolved Solids		☐ F	
		☐ NO_3	

TRACE ELEMENTS
- ☐ Al
- ☐ Ag
- ☐ As
- ☐ B
- ☐ Cd
- ☐ Cr
- ☐ Cu
- ☐ Hg
- ☐ Pb
- ☐ Ni
- ☐ Se
- ☐ Zn
- ☐

☒ Other analyses desired (specify):

TCE = 0.95 ppb
PCE = 6.7 ppb

Date Reported	Analyst
10-19-82	NP

☐ Turb. TU	☐ NH_3-N	☐ BOD	☐ Susp. Solids	☐ PO_4
☐ Spec. Cond. µmhos/cm	☐ ORG-N	☐ Grease	☐ Set Solids ml/l/hour	☐ MBAS

Form LAB-800 (2-80)

United States Summary Judgment Motion, Ex. 85, Page 899

State of California · Department of Health
Sanitation and Radiation Laboratory
Southern California Laboratory

SAMPLE FOR CHEMICAL ANALYSIS

Date Received: 11-16-82 (Leave Blank) 7903

Purveyor and Address (include city and county): City of S. Bono

System Number: 36

Serial Number: C 09310

Sampling Point: Del Rosa

Collected by: R. Hurly

Date and Hour Collected: 11/1/82

Type of Sample: ☐ Raw Surface Water ☐ Wastewater ☐ Raw ☐ Chlorinated ☐ Drinking Water: ☐ Raw ☐ Treated ☐ Trade Waste ☐ Other

Send Report To: ☒ WSS Dist. S. Bono ☐ County HD ☐ DOT Dist. # ☐ National Park Serv. ☐ RWQCB # ☐ Other

Results are expressed as mg/l unless specified

☐ GENERAL MINERAL ANALYSIS

			(mg/l as $CaCO_3$)
☐ Ca		☐ Hardness	
☐ Mg		☐ HCO_3	
☐ Fe Total		☐ CO_3	
☐ Mn		☐ OH	
☐ Na		☐ Total Alk.	
☐ K		☐ Cl	
☐ pH		☐ SO_4	
☐ Total Dissolved Solids		☐ F	
		☐ NO_3	

TRACE ELEMENTS: ☐ Al ☐ Ag ☐ As ☐ B ☐ Cd ☐ Cr ☐ Cu ☐ Hg ☐ Pb ☐ Ni ☐ Se ☐ Zn ☐

☒ Other analyses desired (specify):

TCE = 1.3 µg/l

PCE = 10 µg/l

Date Reported: 11-17-82

Analyst: P.H.

☐ Turb. TU	☐ NH_3-N	☐ BOD	☐ Susp. Solids	☐ PO_4
☐ Spec. Cond. µmhos/cm	☐ ORG-N	☐ Grease	☐ Set Solids ml/l/hour	☐ MBAS

Form LAB-800 (4/74)

State of California · Department of Health
Sanitation and Radiation Laboratory
Southern California Laboratory
SAMPLE FOR CHEMICAL ANALYSIS

Date Received: 11-16-82 (ave Blank)

Lab No: 7905

Purveyor and Address (include city and county): City of San Bernardino

System Number: 36

Serial Number: C 09312

Sampling Point: Del Rosa Reservoir

Collected by: R. Lewis.

Date and Hour Collected: 11/15/82

Type of Sample: ☐ Raw Surface Water ☐ Drinking Water: ☐ Raw ☐ Treated ☐ Wastewater ☐ Raw ☐ Chlorinated ☐ Trade Waste ☐ Other

Send Report To: ☒ WSS Dist. # S. Bdno ☐ County HD ☐ DOT Dist. # ☐ National Park Serv. ☐ RWQCB # ☐ Other

Results are expressed as mg/l unless specified

☐ GENERAL MINERAL ANALYSIS

☐ Ca		☐ Hardness (mg/l as $CaCO_3$)	
☐ Mg		☐ HCO_3	
☐ Fe Total		☐ CO_3	
☐ Mn		☐ OH	
☐ Na		☐ Total Alk.	
☐ K		☐ Cl	
☐ pH		☐ SO_4	
☐ Total Dissolved Solids		☐ F	
		☐ NO_3	

TRACE ELEMENTS

☐ Al ☐ Ag ☐ As ☐ B ☐ Cd ☐ Cr ☐ Cu ☐ Hg ☐ Pb ☐ Ni ☐ Se ☐ Zn ☐

☒ Other analyses desired (specify):

TCE = 1.4 µg/l

PCE = 9.6 µg/l

Date Reported	Analyst
11-17-82	P.A.

☐ Turb TU	☐ NH_3-N	☐ BOD	☐ Susp Solids	☐ PO_4
☐ Spec. Cond. µmhos/cm	☐ ORG-N	☐ Grease	☐ Set Solids ml/l/hour	☐ MBAS

Form LAB-800 (4/74)

United States Summary Judgment Motion, Ex. 85, Page 901

State of California Department of ...
Sanitation and Radiation Laboratory
Southern California Laboratory

SAMPLE FOR CHEMICAL ANALYSIS

11/24/[redacted] (Leave Blank) 7948

Purveyor and Address (include city and county): City of S. Bdno.

System Number: 36

Serial Number: C 16809

Sampling Point: Mt. Tank (13')

Collected by: Cox

Date and Hour Collected: 9:00 Am 11/23/82

Type of Sample: ☐ Raw Surface Water ☐ Wastewater ☐ Drinking Water: ☐ Raw ☐ Chlorinated ☐ Raw ☐ Treated ☐ Trade Waste ☐ Other

Send Report To: ☒ WSS Dist. # S. Bdno ☐ County HD ☐ DOT Dist. # ☐ National Park Serv. ☐ RWQCB # ☐ Other

Results are expressed as mg/l unless specified

☐ GENERAL MINERAL ANALYSIS

			(mg/l as $CaCO_3$)
☐ Ca		☐ Hardness	
☐ Mg		☐ HCO_3	
☐ Fe Total		☐ CO_3	
☐ Mn		☐ OH	
☐ Na		☐ Total Alk.	
☐ K		☐ Cl	
☐ pH		☐ SO_4	
☐ Total Dissolved Solids		☐ F	
		☐ NO_3	

TRACE ELEMENTS: ☐ Al ☐ Ag ☐ As ☐ B ☐ Cd ☐ Cr ☐ Cu ☐ Hg ☐ Pb ☐ Ni ☐ Se ☐ Zn ☐

☒ Other analyses desired (specify):

TCE = 0.63 µg/l

PCE = 15 µg/l

[redacted]

Date Reported	Analyst
11-24-82	P.H.

☐ Turb. TU	☐ NH_3-N	☐ BOD	☐ Susp Solids	☐ PO_4
☐ Spec. Cond. µmhos/cm	☐ ORG-N	☐ Grease	☐ Set Solids ml/l/hour	☐ MBAS

Form LAB-800 (4/74)

United States Summary Judgment Motion, Ex. 85, Page 902

State of California · Department of Health
Sanitation and Radiation Laboratory
Southern California Laboratory
SAMPLE FOR CHEMICAL ANALYSIS

Date Received: 7-28-8[illegible] | Lab. (Blank): [illegible]

Purveyor and Address (include city and county): City of San Bernardino

System Number: B 6

Serial Number: C 11775

Sampling Point: Del Rosa Tank

Collected by: WCG

Date and Hour Collected: 7-23-82

Type of Sample: ☐ Raw Surface Water ☐ Drinking Water: ☐ Raw ☐ Treated ☐ Wastewater ☐ Raw ☐ Chlorinated ☐ Trade Waste ☐ Other

Send Report To: ☒ WSS Dist. # 9 (Bdo) ☐ County HD ☐ DOT Dist. # ☐ National Park Serv. ☐ RWQCB # ☐ Other

Results are expressed as mg/l unless specified

☐ GENERAL MINERAL ANALYSIS

			(mg/l as $CaCO_3$)
☐ Ca		☐ Hardness	
☐ Mg		☐ HCO_3	
☐ Fe Total		☐ CO_3	
☐ Mn		☐ OH	
☐ Na		☐ Total Alk.	
☐ K		☐ Cl	
☐ pH		☐ SO	
☐ Total Dissolved Solids		☐ NO_3	

TRACE ELEMENTS: ☐ Al ☐ Ag ☐ As ☐ B ☐ Cd ☐ Cr ☐ Cu ☐ Hg ☐ Pb ☐ Ni ☐ Se ☐ Zn ☐

☒ Other analyses desired (specify):

PCE = 16 µg/l
TCE = 1.3 µg/l
Toluene = 37 µg/l
Ethyl benzene = approx 35-40 µg/l
M+P Xylene = approx 180-200 µg/l
O-Xylene = approx 35-40 µg/l

Date Reported	Analyst
7-29-82	P.H.

☐ Turb. TU	☐ NH_3-N	☐ BOD	☐ Susp. Solids	☐ PO_4
☐ Spec. Cond µmhos/cm	☐ ORG-N	☐ Grease	☐ Set Solids ml/l/hour	☐ MBAS

Form LAB-800 (4/74)

United States Summary Judgment Motion, Ex. 85, Page 903

State of California Department of Health
Sanitation and Radiation Laboratory
Southern California Laboratory
SAMPLE FOR CHEMICAL ANALYSIS

Date Received: 8-13-8[illegible] (Leave Blank) 7069

Purveyor and Address (include city and county): SAN Bernardino City

System Number: 36 [illegible]

Serial Number: C 09302

Sampling Point: Mountain Reservoir

Collected by: Roy Kelly

Date and Hour Collected: 12:30 8/12

Type of Sample: ☐ Raw Surface Water ☐ Drinking Water: ☐ Raw ☐ Treated ☐ Wastewater: ☐ Raw ☐ Chlorinated ☐ Trade Waste ☐ Other

Send Report To: ☒ WSS Dist. # 5 ☐ County HD ☐ DOT Dist. # ☐ National Park Serv ☐ RWQCB # ☐ Other

Results are expressed as mg/l unless specified

☐ GENERAL MINERAL ANALYSIS

☐ Ca		☐ Hardness (mg/l as $CaCO_3$)	
☐ Mg		☐ HCO_3	
☐ Fe Total		☐ CO_3	
☐ Mn		☐ OH	
☐ Na		☐ Total Alk.	
☐ K		☐ Cl	
☐ pH		☐ SO_4	
☐ Total Dissolved Solids		☐ F	
		☐ NO_3	

TRACE ELEMENTS: ☐ Al ☐ Ag ☐ As ☐ B ☐ Cd ☐ Cr ☐ Cu ☐ Hg ☐ Pb ☐ Ni ☐ Se ☐ Zn ☐

☒ Other analyses desired (specify):

PCB = 56 µg/l

TCB = 1.3 µg/l

Date Reported: 8-16-82

Analyst: P.A.

☐ Turb. TU	☐ NH_3-N	☐ BOD	☐ Susp. Solids	☐ PO_4
☐ Spec. Cond µmhos/cm	☐ ORG-N	☐ Grease	☐ Set Solids ml/l/hour	☐ MBAS

Form LAB-800 (4/74)

United States Summary Judgment Motion, Ex. 85, Page 904

State of California - Department of Health
Sanitation and Radiation Laboratory
Southern California Laboratory

SAMPLE FOR CHEMICAL ANALYSIS

Date Received: 9-2-82 (Leave Blank)	Lab. No.: 7294	
Purveyor and Address (include city and county): City of San Bernardino	System Number: 3 6	Serial Number: C 07554
Sampling Point: Mtn. Res	Collected by: Roy Hull.	Date and Hour Collected: 8/27/82

Type of Sample:
- ☐ Raw Surface Water
- ☒ Drinking Water:
  - ☐ Raw
  - ☒ Treated
- ☐ Wastewater:
  - ☐ Raw ☐ Chlorinated
  - ☐ Trade Waste
  - ☐ Other _____

Send Report To:
- ☒ WSS Dist. # S.B. ☐ County HD
- ☐ DOT Dist. # _____ ☐ National Park Serv.
- ☐ RWQCB # _____ ☐ Other _____

Results are expressed as mg/l unless specified

☐ **GENERAL MINERAL ANALYSIS**

☐ Ca	___.___	☐ Hardness (mg/l as $CaCO_3$)	___.___
☐ Mg	___.___	☐ HCO_3	___.___
☐ Fe Total	___.___	☐ CO_3	___.___
☐ Mn	___.___	☐ OH	___.___
☐ Na	___.___	☐ Total Alk.	___.___
☐ K	___.___	☐ Cl	___.___
☐ pH	___.___	☐ SO_4	___.___
☐ Total Dissolved Solids	___.___	☐ F	___.___
		☐ NO_3	___.___

L.R.M.

TRACE ELEMENTS

☐ Al ☐ Ag ☐ As ☐ B ☐ Cd ☐ Cr ☐ Cu ☐ Hg ☐ Pb ☐ Ni ☐ Se ☐ Zn ☐

☐ Other analyses desired (specify):

TCE = 0.50 mg/L
PCE = 410 mg/L

Date Reported: 9-3-82	Analyst: P.A.

☐ Turb. TU	☐ NH_3-N	☐ BOD	☐ Susp Solids	☐ PO_4
☐ Spec. Cond. μmhos/cm	☐ ORG-N	☐ Grease	☐ Set Solids ml/l/hour	☐ MBAS

Form LAB-800 (4/74)

United States Summary Judgment Motion, Ex. 85, Page 905

State of California - Department of Health Services
Sanitation and Radiation Laboratory Section
Southern California Laboratory Section
SAMPLE FOR CHEMICAL ANALYSIS

Date Received: 9/23/83 (Leave Blank) | Lab. No. 10098

Purveyor and Address (include city and county): City of San Bernardino

System Number: 36 X 039 | Serial Number: C 03301

Sampling Point: Mountain Tank.

Collected by: Purveyor | Date and Hour Collected: 9/19/83 Am

Type of Sample: ☐ Raw Surface Water ☒ Drinking Water ☒ Raw ☐ Treated ☐ Waste water ☐ Raw ☐ Chlorinated ☐ Trace Waste ☐ Other

Send Report To: ☒ WSS Dist. S. Bldg. ☐ County HD ☐ DOT Dist. # ☐ National Park Serv ☐ RWQCB # ☐ Other

Results are expressed as mg/l unless specified

☐ GENERAL MINERAL ANALYSIS (mg/l as $CaCO_3$)

Ca		Hardness	
Mg		HCO_3	
Fe Total		CO_3	
Mn		OH	
Na		Total Alk	
K		Cl	
pH		SO_4	
Total Dissolved Solids		F	
		NO_3	

TRACE ELEMENTS: Al, Ag, As, B, Cd, Cr, Cu, Hg, Pb, Ni, Se, Zn

☒ Other analyses desired (specify): VOA
chloroform = 1.3 µg/l
bromodichloromethane = 1.2 µg/l
trichloroethylene = 1.1 µg/l
perchloroethylene = 28 µg/l
bromoform = 2.2 µg/l

Date Reported	Analyst
9-26-83	P.H.

Turb	NH_3-N	BOD	Susp Solids	PO_4
Spec Cond µmhos/cm	ORG N	Grease	Set Solids ml/l-hour	MBAS

Form LAB 800 (2 80)

State of California - Department of Health Services
Sanitation and Radiation Laboratory Section
Southern California Laboratory Section
SAMPLE FOR CHEMICAL ANALYSIS

Date Received: 9/28/83 (Leave Blank) | Lab. No. 10164

Purveyor and Address (include city and county): City of San Bernardino

System Number: 36 X 039 | Serial Number: C 03345

Sampling Point: Mountain Tank

Collected by: AFC - | Date and Hour Collected: 9/26/83 1430

Type of Sample: ☐ Raw Surface Water ☒ Drinking Water ☒ Raw ☐ Treated ☐ Waste water ☐ Raw ☐ Chlorinated ☐ Trace Waste ☐ Other

Send Report To: ☒ WSS Dist. # S. Bldg. ☐ County HD ☐ DOT Dist. # ☐ National Park Serv. ☐ RWQCB # ☐ Other

Results are expressed as mg/l unless specified

☐ GENERAL MINERAL ANALYSIS (mg/l as $CaCO_3$)

Ca		Hardness	
Mg		HCO_3	
Fe Total		CO_3	
Mn		OH	
Na		Total Alk	
K		Cl	
pH		SO_4	
Total Dissolved Solids		F	
		NO_3	

TRACE ELEMENTS: Al, Ag, As, B, Cd, Cr, Cu, Hg, Pb, Ni, Se, Zn

☒ Other analyses desired (specify): VOA.
chloroform = 1.2 µg/l
trichloroethylene = 0.52 µg/l
bromodichloromethane = 0.78 µg/l
perchloroethylene = 29 µg/l
bromoform = 3.6 µg/l

Date Reported	Analyst
10-11-83	P.H.

Turb	NH_3-N	BOD	Susp Solids	PO_4
Spec Cond µmhos/cm	ORG N	Grease	Set Solids ml/l-hour	MBAS

Form LAB 800 (2 80)

United States Summary Judgment Motion, Ex. 85, Page 904

State of California - Department of Health Services
Sanitation and Radiation Laboratory Section
Southern California Laboratory Section
SAMPLE FOR CHEMICAL ANALYSIS

Date Received: 9-29-83 (Leave Blank)
Lab. No.: 10134

Purveyor and Address (include city and county): City of San Bernardino
System Number: 36 0397
Serial Number: C 03347

Sampling Point: Mountain Boosters
Collected by: AFC
Date and Hour Collected: 9/26/83 1400

Type of Sample: ☐ Raw Surface Water ☒ Drinking Water ☒ Raw ☐ Treated ☐ Waste water: ☐ Raw ☐ Chlorinated ☐ Trade Waste ☐ Other
Send Report To: ☒ WSS Dist. # ☐ County HD ☐ DOT Dist. # ☐ National Park Serv. ☐ RWQCB # ☐ Other

Results are expressed as mg/l unless specified

☐ GENERAL MINERAL ANALYSIS (mg/l as $CaCO_3$)

☐ Ca		☐ Hardness	
☐ Mg		☐ HCO_3	
☐ Fe Total		☐ CO_3	
☐ Mn		☐ OH	
☐ Na		☐ Total Alk	
☐ K		☐ Cl	
☐ pH		☐ SO_4	
☐ Total Dissolved Solids		☐ F	
		☐ NO_3	

TRACE ELEMENTS: ☐ Al ☐ Ag ☐ As ☐ B ☐ Cd ☐ Cr ☐ Cu ☐ Hg ☐ Pb ☐ N ☐ Se ☐ Zn

☒ Other analyses desired (specify): VOA
chloroform = 1.4 µg/l
bromodichloromethane = 1.2 µg/l
chlorodibromomethane = 0.5 µg/l
[illegible] = [illegible]
trichloroethylene = 1.6 µg/l
[illegible] = [illegible]

Date Reported: 9-[illegible]-83
Analyst: [illegible]

☐ Turb TU	☐ NH_3-N	☐ BOD	☐ Susp Solids	☐ PO_4
☐ Spec Cond µmhos/cm	☐ ORG N	☐ Grease	☐ Set Solids ml/l/hour	☐ MBAS

Form LAB 800 (2-80)

State of California - Department of Health Services
Sanitation and Radiation Laboratory Section
Southern California Laboratory Section
SAMPLE FOR CHEMICAL ANALYSIS

Date Received: 9-29-83 (Leave Blank)
Lab. No.: [illegible]

Purveyor and Address (include city and county): City of San Bernardino
System Number: 36 0397
Serial Number: C 03346

Sampling Point: Dist. System.
Collected by: A.F.C.
Date and Hour Collected: 9/26/83 1335

Type of Sample: ☐ Raw Surface Water ☒ Drinking Water ☒ Raw ☐ Treated ☐ Waste water ☐ Raw ☐ Chlorinated ☐ Trade Waste ☐ Other
Send Report To: ☒ WSS Dist. # ☐ County HD ☐ DOT Dist. # ☐ National Park Serv. ☐ RWQCB # ☐ Other

Results are expressed as mg/l unless specified

☐ GENERAL MINERAL ANALYSIS (mg/l as $CaCO_3$)

☐ Ca		☐ Hardness	
☐ Mg		☐ HCO_3	
☐ Fe Total		☐ CO_3	
☐ Mn		☐ OH	
☐ Na		☐ Total Alk	
☐ K		☐ Cl	
☐ pH		☐ SO_4	
☐ Total Dissolved Solids		☐ F	
		☐ NO_3	

TRACE ELEMENTS: ☐ Al ☐ Ag ☐ As ☐ B ☐ Cd ☐ Cr ☐ Cu ☐ Hg ☐ Pb ☐ N ☐ Se ☐ Zn

☒ Other analyses desired (specify): VOA
chloroform = 1.8 µg/l
trichloroethylene = 1.2 µg/l
bromodichloromethane = 1.8 µg/l
chlorodibromomethane = 1.0 µg/l
perchloroethylene = 22 µg/l
bromoform = 5.4 µg/l

Date Reported: 9-3[illegible]-83
Analyst: P.A.

☐ Turb TU	☐ NH_3-N	☐ BOD	☐ Susp Solids	☐ PO_4
☐ Spec Cond µmhos/cm	☐ ORG N	☐ Grease	☐ Set Solids ml/l/hour	☐ MBAS

Form LAB 800 (2-80)

CC: J. Baranegra
F. Ehrmann
11-14-83

State of California Department of Health
Sanitation and Radiation Laboratory
Southern California Laboratory

SAMPLE FOR CHEMICAL ANALYSIS

Date Received: 6-8-83 (Leave Blank)

Lab No: 9274

Purveyor and Address (include city and county): CITY of SAN BERNADINO

System Number: 3 6 0 3 9

Serial Number: C 22673

Sampling Point: MOUNTAIN TANK

Collected by: W. GEDNEY

Date and Hour Collected: 9:46 6/8/83

Type of Sample: ☐ Raw Surface Water ☐ Waste Water ☐ Raw ☐ Chlorinated ☒ Drinking Water ☒ Raw ☐ Treated ☐ Trade Waste ☐ Other

Send Report To: ☐ W.S.S. Dist. # ☐ County HD ☐ DOT Dist. # ☐ National Park Serv. ☐ R.W.Q.C.B. # ☒ Other: SEB-SB DHC

Results are expressed as mg/l unless specified

☐ GENERAL MINERAL ANALYSIS

			(mg/l as $CaCO_3$)
☐ Ca		☐ Hardness	
☐ Mg		☐ HCO_3	
☐ Fe Total		☐ CO_3	
☐ Mn		☐ OH	
☐ Na		☐ Total Alk.	
☐ K		☐ Cl	
☐ pH		☐ SO_4	
☐ Total Dissolved Solids		☐ F	
		☐ NO_3	

TRACE ELEMENTS: ☐ Al ☐ Ag ☐ As ☐ B ☐ Ba ☐ Cr ☐ Cu ☐ Hg ☐ Pb ☐ N ☐ Se ☐ Zn

☒ Other analyses desired (specify)

YOA-PCE, TCE

Chloroform = 1.5 mg/l
trichloroethylene = 2.0 mg/l
bromodichloromethane = 1.5 mg/l
chlorodibromomethane = 1.1 mg/l
tetrachloroethylene = 30 mg/l
bromoform = 2.8 mg/l

Date Reported: 6-14-83

Analyst: P.H.

☐ Turb.	☐ NH_3-N	☐ BOD	☐ Susp. Solids	☐ PO_4
☐ Spec. Cond.	☐ Org-N	☐ Chlorine	☐ Set. Solids	☐ MBAS

Form LAB 8 (1-14-74)

United States Summary Judgment Motion, Ex. 85, Page 908

Exhibit 86

E-18008

TELEPHONE 383-5141

P. O. BOX 710
ZIP CODE 92403

WATER DEPARTMENT

CITY HALL • 300 NORTH "D" STREET
SAN BERNARDINO, CALIFORNIA 92401

BOARD OF WATER COMMISSIONER
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JOSEPH F. STEJSKAL
DIRECTOR-ENGINEERING
CONSTRUCTION-MAINTENANCE
BERNARD C. KERSEY
CONTROLLER

April 6, 1981

Atchison, Topeka & Santa Fe Railroad
1170 W. Third Street
San Bernardino, CA 92410

Gentlemen:

As Environmental Control Officer of the City of San Bernardino Municipal Water Department, I am charged with the responsibility of conducting and maintaining the Industrial Waste and Pretreatment Programs mandated by law.

In accordance with the Federal Water Pollution Control Act, as amended by Public Law 92-500 enacted October 18, 1971, the City of San Bernardino was required by law to file an application for a Federal Waste Discharge Permit to discharge chlorinated effluent into the Santa Ana River Basin. The permit was granted by the California Regional Water Quality Control Board- Santa Ana Region in December, 1974.

The City of San Bernardino Municipal Water Department is currently discharging wastes under Order 81-106, as amended by Cease and Desist Order 80-53. In order to comply with permit conditions, this Department is required by Federal Law to have an operational industrial monitoring and reporting program for source control of pollutants discharged into the sewer. Each contributing facility discharging to the municipal sewer shall furnish this Department with a list of (1) raw materials used (2) chemicals used; such as acids, caustics, solvents, industrial detergents, etc. (3) end products (4) all wastes, solids or liquid (5) disposition of wastes, if pretreated, discharged to the sewer or hauled to an approved disposal site.

The waste discharge from each contributing facility shall be evaluated as to its impact on the sewerage system and on the operation and maintenance of the San Bernardino Water Reclamation Treatment Plant. In order to make this evaluation, it is essential that this Department be supplied with a list of all chemicals used within your facility or in any pretreatment performed on waste prior to discharge, and that the enclosed Industrial Waste Survey be completed and returned within thirty (30) days from the date of this letter. I appreciate your cooperation in assisting the City to carry out its Industrial Waste Program as required by State and Federal Law.

Should you desire any additional assistance or information, please do not hesitate to call (714) 383-5108.

Very truly yours,

Jim Watson

Jim Watson, ENVIRONMENTAL CONTROL OFFICER
299 Blood Bank Road
San Bernardino, CA 92408

DEFENDANTS' EXHIBIT 567 FOR ID
BRYAN LUI, CSR NO. 11223
DATE: 6-17-99
WITNESS: WATSON

United States Summary Judgment Motion, Ex. 86, Page 909

CITY 08-1442

567

Exhibit 87

SAN BERNARDINO MUNICIPAL WATER DEPARTMENT

Inter-Departmental Correspondence

July 18, 1984

TO: Joe Stejskal, Director of Engineering-Construction-Maintenance

FROM: Fred Ehemann, Water Quality Control Technician

SUBJECT: TCE & PCE RESULTS

DATE: 6/27/84.
LOCATION: Santa Fe Railway
TIME: 3:00 P.M.
TAKEN BY: Fred

RESULTS: TCE = 22.54 PPB
PCE = 146.42 PPB

DATE: 6/28/84
LOCATION: Santa Fe Railway
TIME: _____
TAKEN BY: Curtis

RESULTS: TCE = 24.59 PPB
PCE = 68.36 PPB

DATE: 6/28/84
LOCATION: Wastewater Treatment Plant
TIME: _____
TAKEN BY: Curtis

RESULTS: TCE = < 1.0 PPB
PCE = < 1.0 PPB

DATE: 7/2/84
LOCATION: Ice Plant Well
TIME: 9:00 A.M.
TAKEN BY: Fred

RESULTS: TCE = < 1.0 PPB
PCE = < 1.0 PPB

The results above were received by phone, formal results will be sent to us by Fruitgrowers Laboratory. The action level for PCE is 4 PPB and for TCE is PPB.

Sincerely,

Fred Ehemann

Fred Ehemann
Water Quality Control Technician

FE:pe

DEFENDANTS' EXHIBIT 569 FOR ID
BRYAN LUI, CSR NO. 11223
DATE: 6-17-99
WITNESS: WATSON

1800 231 0270

75 8/79

United States Summary Judgment Motion, Ex. 87, Page 910

CITY 08-1422

569

Exhibit 88

WATER DEPARTMENT

CITY HALL

300 N. "D" STREET 92401 • P. O. BOX 710 92402

SAN BERNARDINO, CALIFORNIA

(714) 383-5141

BOARD OF WATER COMMISSIONERS

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GENERAL MANAGER

JOSEPH F. STEJSKAL
DIRECTOR, ENGINEERING-CONSTRUCTION-MAINTENANCE

BERNARD C. KERSEY
DIRECTOR, ADMINISTRATION & FINANCE

July 26, 1984

Mr. Tim Lassen
Environmental Engineer
Santa Fe Railroad
5200 E. Sheila Street
Los Angeles, CA 90040

Dear Mr. Lassen:

Our routine monitoring and subsequent analysis of the wastewater discharge from the industrial waste plant has indicated unusually high levels of both trichloroethylene and tetrachloroethylene (see results attached). The action level for these toxic materials is around 4 parts per billion.

I understand these materials are used in the plant as a degreaser and are supposed to be recycled and disposed of to a hazardous waste site. This material must not be allowed to be disposed of to the industrial waste plant, as it constitutes a violation of city, state and federal regulations.

I request that you investigate this matter and inform me of your findings.

Very truly yours,

Jim Watson

Jim Watson
Environmental Control Officer

JW:eg
Attach.

cc: H. Wessel (w/attach)

DEFENDANTS' EXHIBIT 570 FOR ID
BRYAN LUI, CSR NO. 11223
DATE: 6-17-99
WITNESS: WATSON

United States Summary Judgment Motion, Ex. 88, Page 911

CITY 08-1418

570

California Water Labs, Inc.
P. O. BOX 4249
1430 CARPENTER LANE — SUITE G
MODESTO, CA 95352
PHONE (209) 527-4050

rveyor CITY OF SAN BERNADINO
reet
ty Zip
nple I.D. Santa Fe
llected By Fred

Lab I.D. T-1688
Purchase Order
Date Collected 6/27/84

PURGEABLE HALOCARBONS (METHOD 601)

COMPOUND	ppb DETECTED	COMPOUND	ppb DETECTED
oromethane		Carbontetrachloride	
hlorodifluoromethane		Bromodichloromethane	
momethane		1,2-Dichloropropane	
yl Chloride		Trans-1.3-Dichloropropene	
orethane		Trichloroethylene	22.54
hylene Chloride		Dibromochloromethane	
hlorofluoromethane		Cis-1,3-Dichloropropene	
Dichloroethylene		1,1,2-Trichloroethane	
ochloromethane		Bromoform	
Dichloroethane		1,1,2,2-Tetrachloroethane	
s-1,2-Dichloroethylene		Tetrachloroethylene	146.42
roform		Chlorobenzene	
Dichloroethane			
1-Trichloroethane			

Received 7/2/84
Started 7/5/84
Completed 7/6/84

By W. E. Matus
Jeff Harris

ence: Fed. Reg./Vol.44, No.233 Dec. 1979

CITY 08-1419

United States Summary Judgment Motion, Ex. 88, Page 912

Exhibit 89

CITY OF SAN BERNARDINO WATER RECLAMATION PLANT
ENVIRONMENTAL CONTROL INSPECTION REPORT

INTERED 9/13/93

DATE/TIME 9-13-93 10:00 I.U. NO. 3011 PERMIT NO. 3011S
NAME OF FACILITY Tune-Up Masters #58
ADDRESS/CITY 2706 W Foothill Bl, Rialto 92376
CONTACT PERSON

TYPE OF INSPECTION MA: 2001 Corporate Center Drive, Newbury Park, CA 91320

Annual [x] Bi-Annual [ ] Unscheduled [ ] _____ [ ]

INSPECTION PROCEDURE

Inspection of Manufacturing Facility (time): Maint & Repair of Autos
Observations:

Inspection of Chemical Storage Area (time): Adequate No Floor drains
Observations: Safety Clean
Big Break Ind. Cleaner & degreaser

Inspection of Sand/Grease Interceptor (time): This interceptor appears in Need
Observations: of maint. Wait on LAB results (Verbal was given

Inspection of Sample Location (time): Sand Interceptor
Observations:

Size of Interceptor: 250 Gal.

Inspection of Waste Hauler Records (time): All records go to corporate
Observations: office.

Inspection of Spill Containment Area (time): Adequate
Observations:

Inspection of Pretreatment Equipment (time): sand interceptor serves as
Observations: pretreatment

Inspection of Sampling Equipment (time): N/A
Observations:

Was Sample Taken - YES NO Was Photograph Taken - YES NO

Inspection of Water Softener - YES NO N/A If yes, type:
Observations:

Overall Comments: Visible O&G Wait on lab results B4 issuing NOV

Inspected By: Harold P. Wa
Craig Cashin

"Certificate of Inspection" processed: NO

Authorized by
James H. Watson, Environmental Control Officer
San Bernardino Water Reclamation Plant
299 Blood Bank Road
San Bernardino, California 92408
(714) 384-5383

WHITE-permit file/YELLOW-adm office

DEFENDANTS EXHIBIT 572 FOR ID
BRYAN LUI, CSR NO. 11223
DATE: 6-17-99
WITNESS: WATSON

CITY 04E-2083

572

United States Summary Judgment Motion, Ex. 89, Page 913

City Of San Bernardino Water Department
Environmental Control Regulations

Certificate of Inspection

This is to certify that

TUNE-UP MASTERS #58 — Company

3011 — Permit

was inspected on 13-SEP-93 — Date

in accordance with the San Bernardino Municipal Code Chapter 13:32 and other applicable Federal or State regulations.

WAGNER/CASTRO — Inspector

Environmental Control Officer

CITY 04E-2084

United States Summary Judgment Motion, Ex. 89, Page 114

BACTERIOLOGY
WATER TESTING
HAZARDOUS WASTE TESTING
CA DHS CERTIFICATION 1156

LABORATORIES
6100 QUAIL VALLEY COURT, RIVERSIDE

E.S. BABCOCK & SONS, INC.
ESTABLISHED 1906

909/653-3351
FAX 909/653-1662

P.O. BOX 432
RIVERSIDE, CA 92502

09/27/93

To: San Bernardino WWTP
Attn: Jim Watson
299 Blood Bank Rd.
San Bernardino, CA 92408

Lab No. 930914-800
Invoice No. 95701
Customer No. sa0311

	Submitted	Sampled
Sample Marked: Tune-Up Masters #58 Permit #3011 Grab Wastewater	By CM	HW
	Date 09/14/93	09/13/93
	Time 9:55	10:15

Chain of Custody on file: Y

N.D.V. NO 10-5-93

FILE

REVIEWED BY

COMPUTER INPUT 10/4/93

Purgeable Halocarbons and Aromatics

EPA Method 624

Parameter	Results(µg/L)	Parameter	Results(µg/L)
Acrolein	ND*	1,1-Dichloroethene	ND
Acrylonitrile	ND*	trans-1,2-Dichloroethene	ND
Benzene	ND	1,2-Dichloropropane	ND
Bromodichloromethane	ND	cis-1,3-Dichloropropene	ND
Bromoform	ND	trans-1,3-Dichloropropene	ND
Bromomethane	ND	Ethylbenzene [redacted]	2[redacted]
Carbon tetrachloride	ND	Methylene chloride	ND**
Chlorobenzene [redacted]	[redacted]	1,1,2,2-Tetrachloroethane	ND
Chloroethane	ND	Tetrachloroethene	ND
2-Chloroethylvinyl ether	ND**	Toluene	ND
Chloroform	ND	1,1,1-Trichloroethane	ND
Chloromethane	ND	1,1,2-Trichloroethane	ND
Dibromochloromethane	ND	Trichloroethene	ND
1,2-Dichlorobenzene	ND	Trichlorofluoromethane	ND
1,3-Dichlorobenzene	ND	Vinyl chloride	ND
1,4-Dichlorobenzene [redacted]	2[redacted]	Xylenes (total) [redacted]	17[redacted]
1,1-Dichloroethane	ND		
1,2-Dichloroethane	ND		

170
22
24
+ 8.6
224.6 ug/l
÷ 1000
.22 mg/l TTO
Does not exceed permit limit

ND=None detected, detection limit: 5.0 µg/L NI=Not identifiable
Date analysis completed: 09/18/93
Notes: *Detection limit = 100 µg/L **Detection limit = 10 µg/L

cc:

Edward S. Babcock & Sons, Inc.

CITY 04E-2085

United States Summary Judgment Motion, Ex. 89, Page 915

BACTERIOLOGY
WATER TESTING
HAZARDOUS WASTE TESTING
CA DHS CERTIFICATION 1156

LABORATORIES
6100 QUAIL VALLEY COURT, RIVERSIDE

E.S. BABCOCK & SONS, INC.
ESTABLISHED 1906

909/653-3351
FAX 909/653-1662

P.O. BOX 432
RIVERSIDE, CA 92502

09/27/93

To: San Bernardino WWTP
Attn: Jim Watson
299 Blood Bank Rd.
San Bernardino, CA 92408

Lab No.	930914-796
Invoice No.	95700

Sample Marked:
Tune-Up Masters #58
Permit #3011 Grab
Wastewater

Submitted	Sampled
CM	HW
09/14/93	09/13/93
9:55	10:15

Chain of Custody on file: Y

Parameter Name	Results	Parameter Name	Results
Sodium (Na)	43 mg/L		
Chloride (Cl)	22 mg/L		
Biochemical Oxygen Demand[5]	220 mg/L		
Oil and Grease	269 mg/L		
Total Suspended Residue	160 mg/L		

N.O.V. NO 10/5/93
FILE
REVIEWED BY
COMPUTER INPUT 10/4/93

Date analysis completed: 09/22/93

Notes:

cc:

Edward S. Babcock & Sons, Inc.

CITY 04E-2086

Exhibit 90

IN THE UNITED STATES DISTRICT COURT
FOR THE CENTRAL DISTRICT OF CALIFORNIA

STATE OF CALIFORNIA, on behalf of the CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL, Plaintiff, vs. UNITED STATES OF AMERICA, DEPARTMENT OF THE ARMY, and DOES 1 - 100, inclusive. Defendants.	No. CV 96-5205MRP(VAPx) No. CV 96-8867MRP(VAPx) (Consolidated) Hon. Mariana R. Pfaelzer
CITY OF SAN BERNARDINO MUNICIPAL WATER DEPARTMENT, Plaintiff, vs. UNITED STATES OF AMERICA, DEPARTMENT OF THE ARMY, and DOES 1 - 100, inclusive. Defendants	DECLARATION OF HENRY R. STONER

Henry R. Stoner declares and states as follows:

1. I have lived and worked in northern New Jersey for about 34 years, and currently reside at 343 West End Avenue, North Plainfield, New Jersey.

2. I have worked as a chemist in the industrial paint and coatings field since 1962. My areas of experience include all kinds of coal tar coatings, including those used on the interiors of steel water reservoirs. I worked for the Koppers Company ("Koppers") from May 1956 to April 1988, as a development chemist, as Technical Director for Coatings, and finally as manager, Governmental Compliances, Coatings. I served as Koppers' Technical Director for Coatings from December 1972 to October 1984, and as eastern region Coatings Operations Manager from October 1984 to March 1986. During the 1970s and 1980s, I was familiar with coatings manufacturing, uses, sales and other matters in southern California. I have also worked on the American Water Works Association's Steel Water Pipe Committee.

3. Since retiring from Koppers in 1988, I have worked as an industrial coating and paint consultant. My work has included efforts on behalf of the paint and coatings industries, including water utilities, along with the inspection of steel water tanks.

4. Koppers manufactured cold-applied and hot-applied coal-tar coatings in a number of facilities during the 1950s through the1980s, including at its plant in Fontana, California.

5. From the 1960s until approximately 1975, Koppers used trichloroethylene ("TCE") as a solvent ingredient in its cold-applied coal tar product, "Koppers Bitumastic Super Tank Solution" ("Super Tank"), along with other solvents toluene and xylene. "Super Tank" was commonly used to coat the interior of steel potable water storage reservoirs in southern California during that time. This product was also commonly used to coat the exteriors and line the interiors of ferrous water transmission and distribution pipes in water utility systems in southern California.

6. Koppers also sold compounds to be used in connection with its coatings as thinners and cleaners. One of these compounds, "Koppers Thinner 2000C," was a mixture of perchloroethylene ("PCE") and toluene. Another, "Koppers Thinner 2000," was composed of xylene. Thinners to be used with these products generally consisted of the same solvents used in the formulas of those products.

7. In approximately 1975, because of certain environmental and health issues, Koppers stopped using TCE as a solvent ingredient in "Super Tank," and substituted PCE for that solvent in its product formula. Other solvents used in conjunction with the PCE in the product included toluene and xylene.

8. The Engard Company manufactured "Engard 800," a product which competed directly with Koppers' "Super Tank " during parts of the 1970s and 1980s.

9. The Tnemec No. 21 Thinner was composed of a like solvent mixture as Koppers Thinner 2000C: a mixture of PCE and toluene. This solvent system was used in the Tnemec product which competed with Koppers' Bitumastic Super Tank Solution.

10. TCE was also used in the 1960s through the late 1970s as a solvent ingredient in Koppers' Bitumastic Jet-Set Primer, a product developed for the application to steel pipe and reservoir surfaces before the application of hot-applied coal-tar coating products. In the late 1970s and early 1980s, certain solvent changes were made in both the air pollution control version and the regular and electrostatic version of this primer product. In the late 1970s, PCE was substituted for TCE in the air pollution control version. In the early 1980s, 1,1,1 trichloroethane was substituted for PCE in the regular and electrostatic version.

11. Air pollution control versions of certain products arose because of regulations in California starting in the mid-1960s. The South Coast Air Quality management District ("SCAQMD") was created by California as an agency to manage air quality in the area of Los Angeles and other nearby counties. The SCAQMD began adopting rules and regulations to control specific air pollutants in approximately 1966. Certain solvents (for example, xylene and toluene) were found to create more smog conditions, were labeled as photochemically reactive, and their usage was therefore limited. The total combined aggregate permitted for these solvents in products was a maximum of 20 percent of the solvent system by volume. The other 80 percent of a solvent system in these products was to be made from non-photochemically reactive solvents.

12. The solvents that best dissolved the coal tar pitches used in the Koppers products described above were in this group. Alternate solvents that were the next best solvents for coal tar pitches and that would meet air pollution requirements were chlorinated hydrocarbon solvents such as TCE and PCE. That is why these solvents were selected as substitutes.

13. TCE and PCE are each heavier than air in gaseous form and heavier than water in liquid form. In other words, TCE and PCE both have specific gravities greater than one.

14. Attached to this declaration as Attachments 1 through 3 are copies of three Koppers coal tar product technical data sheets: an April 1983 Technical Data sheet for "Bitumastic Super Tank Solution" (Attachment 1), an April 1984 Technical Data Sheet for

"Bitumastic Super Tank Solution - High Solids" (Attachment 2), and a July 1984 Technical Data Sheet for "Bitumastic Tank Solution" (Attachment 3). I have retained the originals of these data sheets in my reference files since retiring from Koppers in 1988.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge, information and belief.

Dated: September 10, 1999

North Plainfield, NJ

Henry R. Stoner

HENRY R. STONER

KOPPERS

Protective Coatings

TECHNICAL DATA SHEET

TYPE OF COATING
COAL TAR

adhesion apparently OK over mill undercoat only on sandblasted steel.

Product: BITUMASTIC SUPER TANK SOLUTION

no good over mill Undercoat on smooth metal surfaces.

Do not use over 621 Primer
Non-Vol wt% = 64

RECEIVED
MAY 11 1983
E. R. CTGS. DEV.

6/4/82 VOC
-4.4#/gal

DESCRIPTION: Bitumastic Super Tank Solution is a heavy duty, high build, cold applied, highly water resistant coal tar base coating. After normal agitation it is ready to apply. It is normally self priming and will produce a dried film thickness of 8 to 10 mils per coat with good film thickness retention on edges. The coating dries by solvent evaporation and is easy to recoat or repair. The dried film will not sag or flow at maximum temperatures encountered in normal atmospheric exposure and it will not crack at -20°F. Bitumastic Super Tank Solution has an unlimited shelf life with a minimum of settling. It is made from pitch derived from suitable tars, selected solvents and mineral fillers affording a highly water-resistant coating.

Available in Type I (EPA Grade) and Type II (EPA acceptance pending).

USE: FOR INDUSTRIAL USE ONLY. NOT INTENDED FOR USE IN THE HOME.

It is designed primarily for the long-term protection of the interior of large steel water storage tanks and the interior of steel water transmission pipelines used for either potable or irrigation water service.

DO NOT USE FOR DEAD END, STAGNANT OR VERY LOW FLOW LINES.

DO NOT INTERMIX OR INTERCOAT TYPES I AND II.

Its required thick coat application deposits 4 to 5 times the thickness of conventional paint.

TECHNICAL DATA:	TYPE I	TYPE II
Number of coats:	2 minimum	2 minimum
Volume solids:	63%	60%
Theoretical coverage, mil sq.ft./gal.:	1010	960
Coverage to achieve minimum dry film thickness, sq.ft./gal./coat (allows for approximately 20% application loss):	80 to 100	75 to 95
Film build ratio:		
Minimum dry film required per coat, mils:	8 to 10	8 to 10
Wet film required per coat, mils:	13 to 16	13 to 17
Drying time at 70°F. and 50% relative humidity:		
To touch, hours:	2	2 to 3

2#4 Epoxy Primer on thin coat of STS OK for Primer If 621 or 691 is used must be well aged. See file letter 12/10/75

Attachment 1

Methodical Corp uses this formula for replacing the air in the coating is applied: 33 ft³ of vapor from 1 gallon of solvent. If the coating is 60% N.V. and 1 gal of coating is applied per hour, then 10 x 0.4 = 4 gals of solvent x 33 = 132 cu ft of vapor x 100 ÷ lower of explosion limit, generally = the number of ft³ of air change per hour is needed. (lower exp. limit is generally 1.)

TECHNICAL DATA (Continued):

Between coats: A minimum of 24 hours, or until first coat dries firm.

Before submerging: The normal dry time is 10 days after the topcoat is applied. Thorough drying must be obtained between coats and after application of the final coat prior to submerging. It is essential that the solvent vapors released during application and from the deposited film be removed from the vessel or tank by means of exhaust blowers or suction fans. Ventilation blowers or fans should be ducted to or from the bottom of the tank.

During coating application, the volume of fresh air introduced must provide good air movement. The volume of fresh air should be not less than 300 cu. ft. air/minute for each one gallon of coating applied/hour. It is customary in large tanks (0.5-2MM gallons) to use a ducted 10,000 c.f.m. blower.

After application, to completely remove all traces of solvent from the coating or tank, forced ventilation at the rate of at least one change of air/hour should be continued for a period of ten days. Temperature and humidity readings above or below 70°F. and 50% R. H. may extend or shorten the time required to some degree.

Before placing in service, the entire coated surfaces shall be washed down with water and disinfectant, then flushed, according to AWWA D105.

Color: Type I: Flat Black; Type II: Gloss Black.

Thinner: Koppers Thinner 2000C. Do not use ordinary paint thinners, mineral spirits, gasoline or turpentine as they will destroy the material. Do not thin except in cold weather, when ½ pint of Koppers Thinner 2000C per gallon is the maximum amount allowable.

Cleaner: Koppers Thinner 2000C, to clean brushes, rollers and spray equipment.

Surface preparation: Apply only to clean dry surfaces. Remove weld spatter by chipping or grinding. Grind off all sharp edges or high points on weld seams. Remove oil and grease deposits with Koppers Thinner 2000C. Sandblast metal clean to NACE-3 or SSPC-SP6 minimum.

The maximum height of sandblast profile must not exceed 3 mils.

Surfaces must be coated the same day they are sandblasted.

Primer:

Metal: Self-priming. If a shop primer is required, apply one thinned coat of Bitumastic Super Tank Solution for a minimum dry film thickness of 2 mils. Do not store shop-primed steel or the completed Super Tank Solution application where exposed to direct sunlight.

Note: Galvanized and non-ferrous metal surfaces: First degrease with Koppers Thinner 2000C, then prime with Koppers 40 Passivator.

Mixing instructions: Use a low speed power mixer (1/2" electric drill and "Jiffy" blade as examples) to mix thoroughly until smooth and uniform.

TECHNICAL DATA
(Continued):

Methods of application: Brush, roller, conventional or airless spray. Best method of application is spray with airless spray being preferred. Use a technique which will result in a film free of fog or splatter. This will provide a theoretical dry film thickness of 8 to 10 mils when applied at a wet film thickness of 13 to 16 mils for Type I, 13 to 17 mils for Type II.

To insure complete coverage of the welds and in conjunction with the first coat application, the material should be brushed in. Spray over the wet brush coat on the welds.

Airless Spray:

Pump:	Graco 30:1 Bulldog or equivalent.
Hose:	3/8" i.d. to 50 Ft.; 1/2" i.d. over 50 Ft. Use of 1/4" whip end at gun to facilitate handling is recommended.
Gun:	Hand gun only; use 30 mesh manifold filter.
Tip sizes:	.025" to .035"; 12" fan width is suggested.
Pressure:	50 to 90 psi at pump.

Conventional Spray:

Material pump:	Minimum 8:1 ratio.
Hoses:	From material pump: 3/8" i.d. to 100 Ft.; 3/4" i.d. over 100 Ft.; use hoses with solvent resistant linings. From air line: 1/2" i.d.
Gun:	Hand gun; 1/8" tip and 3/16" cap or 1/4" tip and 1/4" cap.
Pressures:	Material: 20 to 50 psi. Atomization: 50 to 80 psi Individual pressure regulators are required for both material pump and atomizing air.

In cold weather, an in-line heater, such as a Speed-Flo, will facilitate application. Use of an in-line heater is highly recommended whenever airless spray is used.

Do not apply at temperatures below 40°F. or if rain threatens before the coating is dry.

Temperature limitations: Dry: Type I: −20°F to 160°F. Wet: 120°F.
Type II: −20°F to 400°F.

Storage life: 1 year minimum

Packaging: 55-gallon drums, 5-gallon pails and 1-gallon cans

PRECAUTIONS: Take these precautions during application and before the coating dries.

See Material Safety Data Sheet for this product.

DANGER!

HARMFUL OR FATAL IF SWALLOWED. VAPOR HARMFUL. SKIN AND EYE IRRITANT. MAY SENSITIZE SKIN TO SUNLIGHT. COMBUSTIBLE.

TYPE I CONTAINS PERCHLOROETHYLENE, TOLUENE AND XYLENE. TYPE II CONTAINS PERCHLOROETHYLENE AND TOLUENE.

Keep away from heat, sparks and flame. Perchloroethylene or its vapors may form corrosive fumes in contact with flames or hot glowing surfaces. Avoid breathing of vapor or spray mist. Avoid contact with eyes and skin. Use an ultraviolet barrier cream on exposed skin. Wash thoroughly after handling. Keep closures tight and upright to prevent leakage. Keep container closed when not in use. In case of spillage, absorb and dispose of in accordance with local applicable regulations. Do not take internally.

KEEP OUT OF REACH OF CHILDREN.

Use with adequate ventilation during application and drying. In tanks and other confined areas, use only with adequate forced air ventilation to prevent dangerous concentrations of vapors which could cause death from explosion or from breathing. Use fresh air masks, clean protective clothing and explosion-proof equipment. Prevent flames, sparks, welding and smoking. Follow OSHA regulations regarding ventilation and respiratory equipment.

FIRST AID: **In case of skin contact,** wash thoroughly with soap and water; **for eyes,** flush immediately with plenty of water for 15 minutes and call a physician. **If sunburn occurs,** treat symptomatically. **If affected by breathing of vapor,** move to fresh air. **If swallowed,** CALL A PHYSICIAN IMMEDIATELY. DO NOT induce vomiting.

IN CASE OF FIRE: Use dry chemical, foam, water fog or CO_2. Cool closed containers with water.

Non-photochemically Reactive.

WARRANTY

All technical advice, recommendations and services are rendered by the Seller gratis. They are based on technical data which the Seller believes to be reliable and are intended for use by persons having skill and knowhow, at their discretion and risk. Seller assumes no responsibility for results obtained or damages incurred from their use by Buyer whether as recommended herein or otherwise. Such recommendations, technical advice or services are not to be taken as a license to operate under or intended to suggest infringement of any existing patent.

Revised April 1983 Supersedes all previous data sheets printed on this product.

KOPPERS

Protective Coatings

TECHNICAL DATA SHEET

TYPE OF COATING
COAL TAR

RECEIVED
AUG 1 1984
E. R. CTGS. DEV.

Product: BITUMASTIC SUPER TANK SOLUTION-HIGH SOLIDS

DESCRIPTION: Bitumastic Super Tank Solution-High Solids is a revised version of one of the best known, most effective protective coatings for use as an interior lining on steel tanks and piping systems for potable and irrigation water services. It is a high build, cold applied, water resistant coal tar coating. It is self-priming on steel, provides required film thickness in two coats, dries by solvent evaporation, and is easy to recoat and repair. The dried coating will not sag or flow at maximum temperatures found in normal atmospheric exposure and will not crack at —20°F.

Compared to preceding versions of the product, Bitumastic Super Tank Solution-High Solids:

1. Provides 10% to 20% higher coverage from the same volume of coating.
2. Contains up to 20% less solvent by volume.
3. Is still easily applied as supplied by brush, roller or spray, without the need to add thinner.
4. Meets all current and proposed air pollution standards for volatile organic compound content (VOC).

Application has been made to the U.S. EPA for acceptance of this product.

USE: FOR INDUSTRIAL USE ONLY. NOT INTENDED FOR USE IN THE HOME.

Bitumastic Super Tank Solution-High Solids is designed for the long-term protection of the interior of large steel storage tanks and steel transmission pipelines for potable and irrigation water service.

DO NOT USE FOR DEADEND, STAGNANT OR VERY LOW-FLOW LINES OR IN SMALL OR LOW-FLOW TANKS (UNDER 10,000 GALLON CAPACITY). DO NOT MIX WITH ANY OTHER VERSIONS OF THIS PRODUCT.

Koppers Company Inc. Pittsburgh Pennsylvania 15219

TECHNICAL DATA:

Number of coats: 2 minimum

Volume solids: 70%

Theoretical coverage: 1125 mil sq. ft/gallon

Coverage to achieve minimum dry film thickness: 90 to 110 sq. ft./gal./coat (allows for approximate 20% application loss).

Film build ratio:

Minimum dry film required per coat: 8 to 10 mils

Wet film required per coat: 12 to 14 mils

Drying time at 70°F. and 50% relative humidity:

To touch: 2 to 3 hours

Between coats: A minimum of overnight to 24 hours.

Before submerging: The normal dry time is 10 days after the topcoat is applied. Thorough drying must be obtained between coats and after application of the final coat prior to submerging. It is essential that the solvent vapors released during application and from the deposited film be removed from the vessel or tank by means of exhaust blowers or suction fans. Ventilation blowers or fans should be ducted to or from the bottom of the tank.

During coating application, the volume of fresh air introduced must provide good air movement. The volume of fresh air should be not less than 300 cu. ft. air/minute for each one gallon of coating applied/hour. It is customary in large tanks (0.5-2MM gallons) to use a ducted 10,000 c.f.m. blower.

After application, to completely remove all traces of solvent from the coating or tank, forced ventilation at the rate of at least one change of air/hour should be continued for a period of ten days. Temperature and humidity readings above or below 70°F and 50% R. H. may extend or shorten the time required to some degree.

Before placing in service, the entire coated surfaces shall be washed down with water and disinfectant, then flushed, according to AWWA D105.

Color: Gloss Black.

Thinner: THINNING NOT REQUIRED. In situations where some thinning is needed use Koppers Thinner 2000 (Xylol) only. Under no circumstances is thinner 2000C to be used.

Cleaner: Koppers Thinner 2000.

TECHNICAL DATA (Continued):

Surface preparation: Apply only to clean dry surfaces. Remove weld spatter. Grind off all sharp edges and rough weld seams. Remove oil and grease deposits with Koppers Thinner 2000. Sandblast metal clean to NACE-3 or SSPC-SP6 minimum.

The maximum height of sandblast profile must not exceed 3 mils.

Surfaces must be coated the same day they are sandblasted.

Primer:

Metal: Self-priming. If a shop primer is required, apply one coat of Bitumastic Super Tank Solution for a minimum dry film thickness of 2 mils. Do not store shop-primed steel or the completed Super Tank Solution application where exposed to direct sunlight. Coating will crack (alligator) if exposed to sunlight.

Note: Galvanized and non-ferrous metal surfaces: First degrease with Koppers Thinner 2000, then prime with Koppers 40 Passivator.

Mixing instructions: Use a low speed power mixer (1/2" electric drill and "Jiffy" blade as examples) to mix thoroughly until smooth and uniform.

Methods of application: Brush, roller, conventional or airless spray. Best method of application is spray with airless spray being preferred. Use a technique which will result in a film free of fog or splatter. This will provide a theoretical dry film thickness of 8 to 10 mils when applied at a wet film thickness of 12 to 14 mils.

To insure complete coverage of the welds and in conjunction with the first coat application, the material should be brushed in. Spray over the wet brush coat on the welds.

Airless Spray:

Pump:	Graco 30:1 Bulldog or equivalent.
Hose:	3/8" i.d. to 50 Ft.; 1/2" i.d. over 50 Ft. Use of 1/4" whip end at gun to facilitate handling is recommended.
Gun:	Hand gun only; use 30 mesh manifold filter.
Tip sizes:	.025" to .035"; 12" fan width is suggested. Use reversible tips.
Pressure:	50 to 90 psi at pump.

Conventional Spray:

Material pump:	Minimum 8:1 ratio.
Hoses:	From material pump: 3/8" i.d. to 100 Ft.; 3/4" i.d. over 100 Ft.; use hoses with solvent resistant linings.
	From air line: 1/2" i.d.
Gun:	Hand gun; 1/8" tip and 3/16" cap or 1/4" tip and 1/4" cap.
Pressures:	Material: 20 to 50 psi.
	Atomization: 50 to 80 psi.

TECHNICAL DATA
Methods of application (Continued):

Individual pressure regulators are required for both material pump and atomizing air.

In cold weather, an in-line heater, such as a Speed-Flo, will facilitate application. Use of an in-line heater is highly recommended whenever airless spray is used.

Do not apply at temperatures below 40°F or if rain is expected before the coating is dry.

Temperature limitations: Dry: — 20°F to 400°F Wet: 120°F

Storage life: 1 year minimum

Packaging: 55-gallon drums, 5-gallon pails and 1-gallon cans

PRECAUTIONS: Take these precautions during application and before the coating dries.

See Material Safety Data Sheet for this product.

DANGER!

FAMMABLE. HARMFUL OR FATAL IF SWALLOWED. VAPOR HARMFUL. SKIN AND EYE IRRITANT. MAY SENSITIZE SKIN TO SUNLIGHT.

CONTAINS XYLENE.

Keep away from heat, sparks and flame. Avoid breathing of vapor or spray mist. Avoid contact with eyes and skin. Use an ultraviolet barrier cream on exposed skin. Wash thoroughly after handling. Keep closures tight and upright to prevent leakage. Keep container closed when not in use. In case of spillage, absorb and dispose of in accordance with local applicable regulations. Do not take internally.

KEEP OUT OF REACH OF CHILDREN.

Use with adequate ventilation during application and drying. In tanks and other confined areas, use only with adequate forced air ventilation to prevent dangerous concentrations of vapors which could cause death from explosion or from breathing. Use fresh air masks, clean protective clothing and explosion-proof equipment. Prevent flames, sparks, welding and smoking. Follow OSHA regulations regarding ventilation and respiratory equipment.

FIRST AID: In case of skin contact, wash thoroughly with soap and water; **for eyes,** flush immediately with plenty of water for 15 minutes and call a physician. **If sunburn occurs,** treat symptomatically. **If affected by breathing of vapor,** move to fresh air. **If swallowed,** CALL A PHYSICIAN IMMEDIATELY. DO NOT induce vomiting.

IN CASE OF FIRE: Use dry chemical, foam, water fog or CO_2. Cool closed containers with water.

Photochemically Reactive. Volatile Organic Compounds Content (VOC) is less than 2.5 pounds/gallon (300 grams/liter) as supplied.

WARRANTY

All technical advice, recommendations and services are rendered by the Seller gratis. They are based on technical data which the Seller believes to be reliable and are intended for use by persons having skill and knowhow, at their discretion and risk. Seller assumes no responsibility for results obtained or damages incurred from their use by Buyer whether as recommended herein or otherwise. Such recommendations, technical advice or services are not to be taken as a license to operate under or intended to suggest infringement of any existing patent.

KOPPERS

Protective Coatings

TECHNICAL DATA SHEET

TYPE OF COATING
COAL TAR

Product: BITUMASTIC TANK SOLUTION

DESCRIPTION: A self-priming, fast-drying protective coating formulated with highly refined tars, selected solvents and other ingredients which impart desirable application and protective qualities. It has a consistency of thin fluid paint or varnish and does not contain added fillers or fibers.

USE: FOR INDUSTRIAL USE ONLY. NOT INTENDED FOR USE IN THE HOME.

RECEIVED
AUG 7 1984
E. R. CTGS. DEV.

A coating designed primarily for the interior protection of metal or concrete potable water tanks, air conditioning equipment and other areas where it is essential to minimize taste and/or odor contamination of air or water.

DO NOT USE FOR DEADENDS, STAGNANT OR VERY LOW FLOW LINES.

TECHNICAL DATA:

Number of coats: 2 or 3

Volume solids: 58%

Theoretical coverage: 930 mils sq. ft. per gal.

Coverage to achieve minimum dry film thickness:
2 mils dry – 370 sq.ft./gal.*
3 mils dry – 250 sq.ft./gal.*
*Allows for approximate 20% application loss. Practical first coat application rate on medium porosity concrete is approximately 200 sq.ft./gal.

Film build ratio:

Minimum dry film required per coat: 2 to 3 mils

Wet film required per coat:
2 mils dry – 3.5 mils wet
3 mils dry – 5.2 mils wet

Drying time at 70°F. and 50% relative humidity:

To touch: 2 hours

Between coats: 12 hours

Prior to use: The normal dry time is 7 days after the topcoat is applied. Thorough drying must be obtained between coats and after application of the final coat before submerging. Forced ventilation is necessary in areas

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Attachment 3

TECHNICAL DATA
Prior to use (Continued): of limited air circulation to insure thorough evaporation and removal of all solvents in the coating film on the potable water tank or container surfaces. Prior to putting the coated potable water tanks or containers into service, they must be flushed thoroughly with clean water to eliminate all taste and odors.

Color: Glossy Black

Thinner: Koppers Thinner 2000. Use also to clean brushes, rollers or spray equipment. Use Koppers Thinner 2000C when air regulatory version is required.

Do not use ordinary paint thinners, mineral spirits, gasoline or turpentine as they will destroy the material.

Do not thin except in cold weather or for spray application, when 1/2 pint of Koppers Thinner 2000 per gallon is the maximum amount allowable.

Cleaner: Koppers Thinner 2000. Use Koppers Thinner 2000C when air regulatory version is required.

Surface preparation:

Steel: Remove all dust, dirt, loose mill scale, welding scale, rust, paint or other foreign material by sand or grit blasting (NACE 3 or SSPC-SP6-63), hand or power brushing and/or scraping. For total immersion blast to a NACE-2 or SSPC-SP10-63. Degrease using Koppers Thinner 2000.

Concrete: Remove all dirt, dust, loose sand and laitance.

All surfaces must be completely dry before applying Bitumastic Tank Solution.

Primer: Metal or Concrete – none.

Methods of application: Brush, roller, dipping, conventional or airless spray.
Note: Natural bristle brushes or phenolic cored rollers only should be used. Do not apply to surfaces that will be exposed to rain before the coating is dry or on surfaces with temperatures below 40°F.

Temperature limitations: dry heat: 400°F. wet heat: 100°F.

Storage life: One year minimum

Pot life: Not applicable, single component

Packaging: 55 gallon drums, 5 gallon pails, and 1 gallon cans

PRECAUTIONS: Take these precautions during application and before the coating dries.

Regular Version	Version conforming to air pollution control regulations
DANGER!	DANGER!

PRECAUTIONS (Continued):

Flammable. Harmful or fatal if swallowed. Vapor harmful. Skin and eye irritant.	Harmful or fatal if swallowed. Vapor harmful. Skin and eye irritant. Combustible.
CONTAINS XYLOL	CONTAINS PERCHLOROETHYLENE AND TOLUOL

Keep away from heat, sparks and flame. Perchloroethylene or its vapors may form corrosive fumes in contact with flames or hot glowing surfaces. Avoid breathing of vapor or spray mist. Avoid contact with eyes and skin. Keep closures tight and upright to prevent leakage. Keep container closed when not in use. In case of spillage, absorb and dispose of in accordance with local applicable regulations. Do not take internally.

KEEP OUT OF REACH OF CHILDREN.

Use with adequate ventilation during application and drying. In tanks and other confined areas, use only with adequate forced air ventilation to prevent dangerous concentrations of vapors which could cause death from explosion or from breathing. Use fresh air masks, clean protective clothing and explosion-proof equipment. Prevent flames, sparks, welding and smoking. Follow OSHA regulations regarding ventilation and respiratory equipment.

FIRST AID: In case of skin contact, wash thoroughly with soap and water; **for eyes,** flush immediately with plenty of water for 15 minutes and call a physician. **If sunburn occurs,** treat symptomatically. **If affected by breathing of vapor,** move to fresh air. **If swallowed,** CALL A PHYSICIAN IMMEDIATELY. DO NOT induce vomiting.

IN CASE OF FIRE: Use dry chemical, foam, water fog or CO_2. Cool closed containers with water.

Non-photochemically Reactive.

WARRANTY

All technical advice, recommendations and services are rendered by the Seller gratis. They are based on technical data which the Seller believes to be reliable and are intended for use by persons having skill and knowhow, at their discretion and risk. Seller assumes no responsibility for results obtained or damages incurred from their use by Buyer whether as recommended herein or otherwise. Such recommendations, technical advice or services are not to be taken as a license to operate under or intended to suggest infringement of any existing patent.

Revised July 1984. Supersedes all previous data sheets printed on this product.

Exhibit 91

6

WATER SYSTEM MASTER PLAN

For The

SAN BERNARDINO MUNICIPAL WATER DEPARTMENT

CITY OF SAN BERNARDINO

CAMP DRESSER & McKEE INC.

And

WILLDAN & ASSOCIATES

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JUNE 1981

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1. INTRODUCTION

The City of San Bernardino Water System currently serves over 118,000 people and uses more than 26 million gallons per day (mgd) of water on an average day. By the year 2000 the population is projected to be over 145,000 and water use is expected to exceed 29 mgd on an average day. Current average per capita usage is approximately 220 gallons per day, varying from a low of 120 in the winter to a high of 450 gallons per day during the summer. More water is used during the summer because of increased in-house consumption, and lawn and garden watering.

The City water system is divided into 14 zones according to pressure differentials based on the topography of the City; see Figure 1-1. The higher zones are generally to the north with the elevation progressively decreasing southward. The lower zones are generally less rugged and flatter than the elevated zones. The general design criterion used to formulate the 14 areas was to maintain from 40-125 pounds per square inch (psi) static pressure in any particular zone. The elevations served range from 2,100 feet in the north to 980 feet to the south.

It is entirely appropriate and economical to segregate the system on the basis of pressure zones. If this were not done, it is probable that the less elevated portion of the City would require pressure reducing valves and the higher sections would have inadequate pressures, particularly during stress conditions. Pressure zones facilitate the ability to balance a water system in terms of supply and demand thus allowing strategic and economical location of reservoirs, booster pumps, wells and interconnecting piping.

The major source of supply is an underlying aquifier, and in addition there are some surface supplies. The water system consists of a network of wells, booster pumps, reservoirs, and piping network. The present system includes over 38,000 service connections in a service area encompassing almost 43 square miles. Over 440 miles of piping comprise the water distribution and transfer network which delivers water to the users. Piping is primarily steel and cast iron. Since the early 1970's, ductile iron pipe has been used in lieu of cast iron. The wells tap the underlying aquifier and the booster pumps lift the water to the reservoirs located in the north portion of the City. In some cases, the wells pump directly to the reservoirs. The reservoirs store water to meet maximum demands and fire flows. Water flows by gravity from the reservoirs to the distribution piping network where local demands are met. Since flow is not dependent upon machinery or electrical power, this gravity system constitutes a major and reliable source of supply during emergencies.

OBJECTIVES

The specific objectives of this Water System Master Plan Study are:

> To review data, analyze land use, project population and ascertain water supply and demands.

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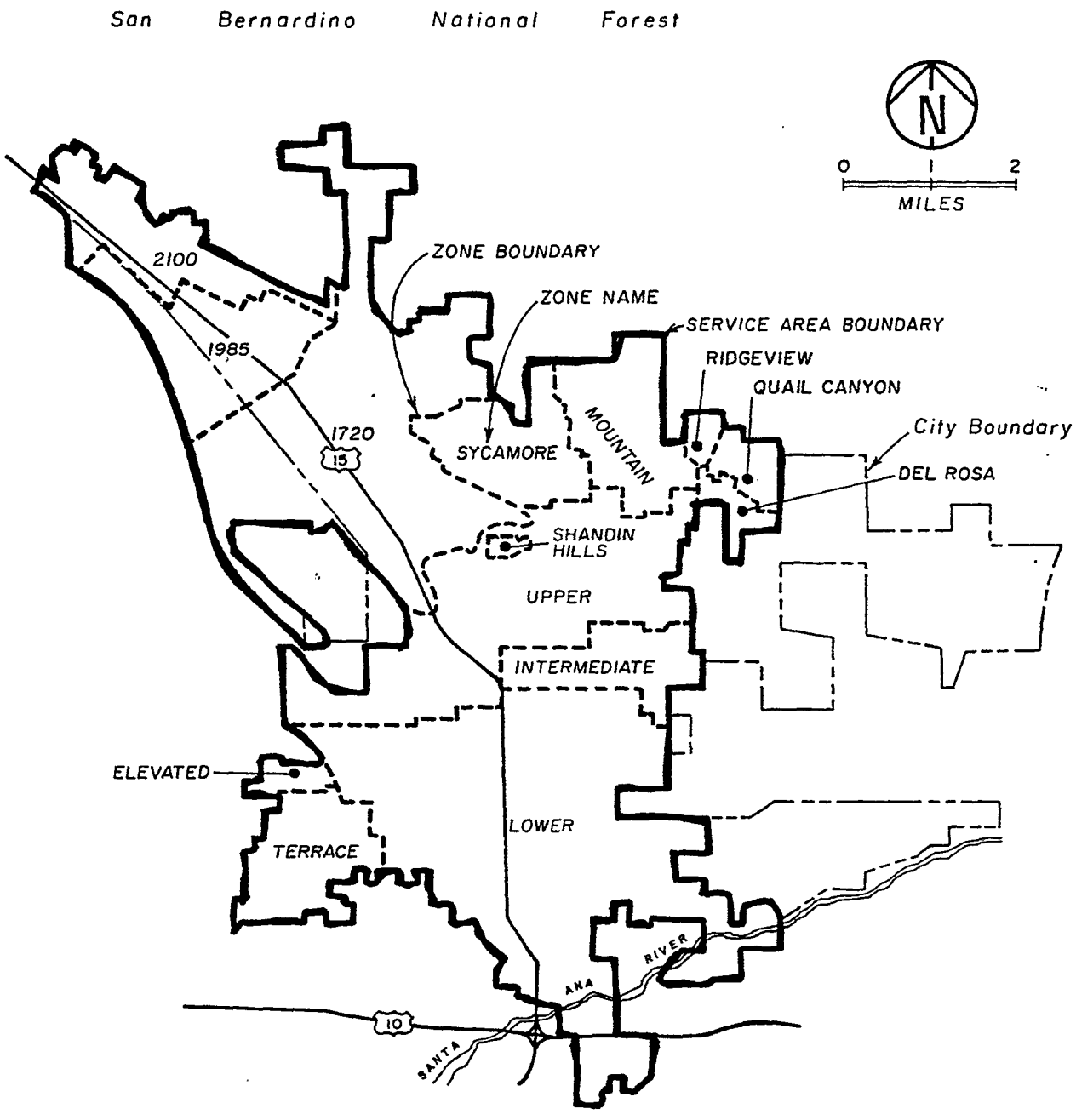

FIGURE I-1

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CITY OF SAN BERNARDINO
PRESSURE ZONES

To evaluate the water system and to identify deficiencies in the existing water distribution, pumping, and storage system.

To formulate alternative water system plans for accommodation of the future expansion of the City.

To prepare a Water System Master Plan report incorporating existing and future needs, with recommended priorities for system improvements and preliminary construction cost estimates.

REPORT SUMMARY

General

The overall water system is sound in terms of supply and delivery and has historically met the needs of the water users.

Water Supply

Being done.

Groundwater wells provide an adequate supply of water under existing conditions. In the future, a choice will need to be made whether to add wells, import water, or some combination thereof. At this time, wells appear to offer the most advantages. However, pumping and transmission costs need to be considered. Imported water can be delivered by gravity, and facilities can be constructed to better satisfy hydraulic conditions. This would require a large capital expenditure.

Booster Pumps

Booster pump capacity in the various zones is generally adequate.

Reservoir Capacity

Reservoir capacity is generally adequate in the lower zones and inadequate in the elevated zones. The situation is caused by demographic patterns within the City. The lower zones tend to be developed with relatively small differences between present and future needs. The areas to the north (especially the elevated zones in the northwest), are experiencing rapid growth. The facilities for the new areas have not caught up with the growth, and therefore, reservoir capacity should be increased. Being done

Distribution Pipes

The distribution pipes service most portions of the City and, from a historical perspective, water delivery has been excellent. However, under extreme stress conditions, e.g., fire flows, low pressures exist in each zone. Computer analysis indicates that the hydraulic capacity of selected pipes should be increased.

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2. SERVICE AREA

The service area of the San Bernardino Municipal Water Department consists of approximately 43 square miles divided into 14 pressure zones. The largest pressure zone is the Lower Zone with an area of 8,542 acres and ground elevations ranging from 980 to 1,150 feet. The smallest pressure zone is the Shandin Hills Zone with an area of 78 acres. The highest and one of the most rapidly developing zones is the 2100 Zone with ground elevations ranging from 1,850 to 2,100 feet. Acreage and land use designation for all zones are listed in Tables 4-1 and 4-2.

The service area is bounded on the north by the San Bernardino National Forest, on the east by the East San Bernardino County Water District, Norton Air Force Base, Valley Farms Mutual Water Company, and the South San Bernardino County Water District. It is bounded on the south by the cities of Loma Linda and Colton and on the west by the West San Bernardino County Water District, the City of Rialto, and the Muscoy Mutual Water Company. The service area and the adjacent water service organizations are shown on Figure 2-1. In addition to supplying water to its own service area, the San Bernardino Municipal Water Department also provides water to the San Bernardino Valley Municipal Water District (SBVMWD) which in turn provides supplemental water to the City of Loma Linda, Victoria Farms Mutual Water Company and the South San Bernardino County Water District.

SERVICE AREA AND CITY BOUNDARY

The Municipal Water Department service boundary and the City limits are not coincident. Large areas such as Norton Air Force Base, East Highland and portions of the San Bernardino Water Utility Corporation are cases in point. For example, Norton Air Force Base and East Highland are within the City limits but do not normally receive City water. In the Highland area (where the City system borders the East San Bernardino County Water District area), the irregular pattern of connections over the years has resulted in alternating segments of in-City and outside-City service areas. With the exceptions described above, it appears that the net area of the Municipal Water Department and the incorporated area of the City are in conformity.

PRESSURE ZONES

The 14 pressure zones are named and numbered. The names are descriptive and relate generally to elevation and geographic orientation. Zone names, overflow elevation of the reservoir serving each zone, and area are listed in Table 2-1.

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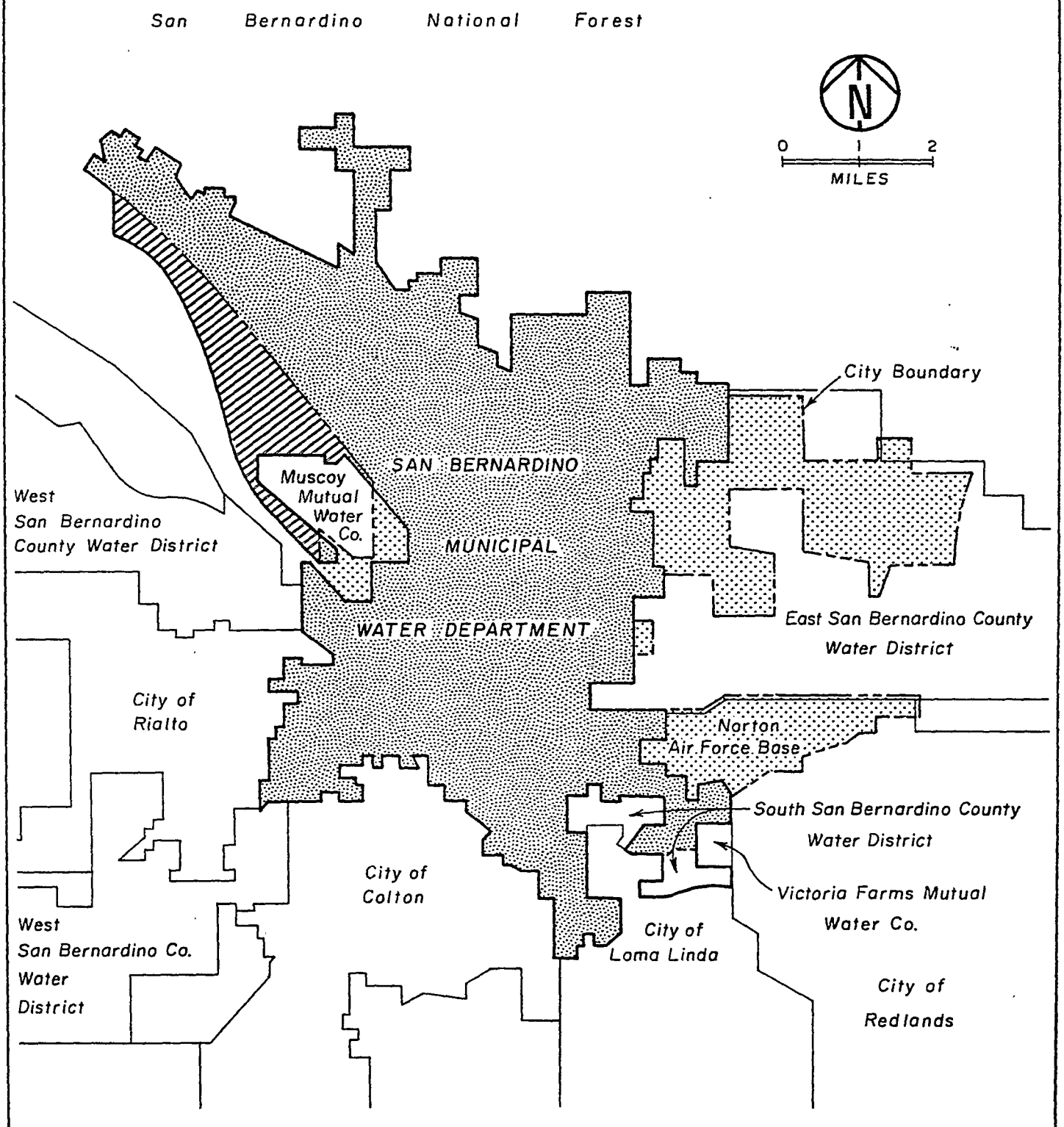

LEGEND

- SERVICE AREA INSIDE CITY LIMITS
- AREAS INSIDE CITY LIMITS NOT IN SERVICE AREA
- AREAS OUTSIDE CITY LIMITS BUT INSIDE THE SERVICE AREA
- AREAS OUTSIDE CITY LIMITS AND OUTSIDE THE SERVICE AREA

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FIGURE 2-1

WATER SERVICE AREAS

TABLE 2-1

PRESSURE ZONES

Zone	Overflow Elevation of Reservoir Serving the Zone (feet)	Area (acres)
2100	2090	847
1895	1894	1659
1720	1720	4181
Sycamore	1580	1274
Mountain	1633	968
Ridgeview	1736	86
Quail	1776	298
Del Rosa	1513	357
Upper	1415	4098
Shandin Hills	1612	78
Intermediate	1311	1399
Elevated	1383	234
Terrace	1312	1483
Lower	1249	8542

OTHER CUSTOMERS

The Municipal Water Department sells water outside of its service area to the City of Loma Linda, the South San Bernardino County Water District and others. These sales all are made through the San Bernardino Valley Muncipal Water District, hence, in reality, the Department has only one customer outside its service area.

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3. DATA SOURCES

Data from this study came from two principal sources, the Municipal Water Department and the City Planning Department. Interpretation of data and additional insight into the water system operations were obtained through discussions with City personnel.

AGENCIES

Municipal Water Department

Documentation and information provided by the Department includes: system maps, current operational procedures, water production records, water use records, energy use records, well groundwater data, pump data, pressure reducing valve characteristics, current plans of major developers, and other miscellaneous items.

System Maps

The following maps and photographs were provided:

Pressure zone map.

Comprehensive system map showing pipes, pipe sizes, valves, pumps, wells, and reservoirs.

A water system schematic diagram.

Aerial photograph of City taken in 1975.

Zone Boundaries

Individual pressure zone maps were prepared and then they were reviewed by Department personnel. Valve closures, control settings, and other operational factors were provided by the Department personnel and were added to the individual zone maps. This established definite zone boundaries and their related service area, water sources, and storage facilities.

Water Production Records

The following water production records were provided:

Monthly production and supplemental data, 1965 through 1979.

Monthly total production from City wells, rental contracts and stock ownership, 1971 through 1977.

Total daily production, 1959 through 1979.

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Monthly well measurements, November 20, 1978 through May 20, 1980.

Output of plants for the 12-month period ending June 30, 1980.

Monthly power analysis summaries for wells in Upper, Intermediate, and Lower Zones, January 1976 through March 1980.

Water Use Records

The following water use records were provided:

Computer print-out of current monthly consumption by zone and by account.

Planning Department

Documentation and information provided by the City Planning Department consisted of the following:

1979 aerial photographs.

City of San Bernardino General Plan, amended in 1980.

Existing zoning maps.

Other

Southern California Edison Company (SCE).

Southern California Association of Governments (SCAG).

San Bernardino Valley Municipal Water District (SBVMWD).

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4. LAND USE AND POPULATION PROJECTIONS

Initially an agriculturally based community, San Bernardino has grown into a residential, commercial and industrial city with a population of 118,000 (1980 census). Norton Air Force Base, which adjoins the City, is its largest economic resource. The railroads and aerospace concerns are the next largest industrial categories in the City. San Bernardino is also a commercial and financial center for the surrounding area. The principal residential pattern is single family, detached dwellings, which developed from the original agricultural community. Due to the increasing scarcity of suitable land and the costs of single family residential units, the current construction trend is toward apartments and condominiums.

LAND USE CATEGORIES

The land use categories selected for use in this study are defined below:

SFR - Single Family Residential: Includes detached single family and duplex dwellings.

MF - Multiple Family: Includes attached dwellings, row housing, garden apartments, high rise apartments, and mobile home parks.

C - Commercial: Includes business districts, regional shopping centers, office centers, neighborhood and roadside commercial development, hotels, motels, warehousing, building materials (hardware, lumber yards, etc.), and farm machinery, miscellaneous retail trades (e.g., auto wrecking).

LI - Light Industrial: Includes manufacturing and industrial areas including associated warehouses, storage yards, and parking areas.

HI - Heavy Industrial: Includes foundaries, scrap yards, primary metals, mechanical processing, chemical processing, and associated facilities.

OS - Open Space: Includes parks, recreation areas and associated facilities, golf courses, cemeteries, campgrounds, and greenbelts.

AG - Agricultural: Includes orchards, vineyards, truck and field crops, specialty farms (horticulture), nursery, greenhouses, grazing, dairy, poultry, and feed lots.

PUB - Public Facilities: Includes schools, libraries, museums, government office buildings, neighborhood parks, utilities.

VS - Vacant Space: Includes vacant land and unimproved land within the National Forest.

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EXISTING LAND USES

Approach

The initial step in the development of the existing land uses was to develop a composite map from the several data sources. The land uses appurtenant to each water system junction were subsequently determined from this map using the computer digitizing measurement technique. The tabulation of existing land use for each pressure zone is presented in Table 4-1. The minimum parcel size considered was 0.25 acre. For example, a commercial area in a predominantly residential zone was not considered unless it exceeded 0.25 acres.

Data Sources

The data sources for the determination of the existing land uses were: 1979 aerial photographs; a 1974 land use map prepared by Southern California Edison and adopted by the San Bernardino Valley Municipal Water District for use in the San Bernardino Wastewater Management Facility Plan; maps of pressure zones; City General Plan; and existing zoning maps.

FUTURE LAND USES

Approach

Long range forecasts, such as the 20 year projection made in this study, require assumptions be made relative to long-run trends which are expected to prevail over the forecast period. It is not necessary, nor productive, to develop assumptions relative to short-run fluctuations of the various economic factors over the forecast period. Therefore, assumptions stated deal only with anticipated long-range trends. The methodology used in the year 2000 land use study was to project and locate land use change over approximately a 20 year forecast period, consistent with the projections of population growth and community plans defined for the study area. Estimates of the location of new residential development, other primary economic development, and public development were based on an evaluation of the impact of important growth inducing and constraining factors identified in the study. The projected year 2000 land use acreages are tabulated for each pressure zone in Table 4-2.

Data Sources

The data sources for determining the year 2000 land uses were the year 1995 future land use map compiled by Southern California Edison; the 1978 SCAG forecast policy; preliminary City forecast for the year 2000; and conversations with the City of San Bernardino Planning Director, Ron Smith.

POPULATION FORECASTING

A review of past, present, and future population projections for the City of San Bernardino were examined at the onset of this study. The population data, based upon interpolations of 1975 special census population figures, may prove obsolete based upon the findings of the upcoming official 1980 census population data. However, it is the opinion of the City staff that

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TABLE 4-1

1980 LAND USE
(acres)

ZONE \ CATEGORY	SFR	MF	C	LI	HI	OS	AG	PUB	VS	TOTAL
2100	24	22	0	0	0	108	188	14	491	847
1895	332	0	13	91	24	8	0	3	1188	1659
1720	501	0	8	0	0	0	0	218	3454	4181
Sycamore	795	11	22	0	0	51	0	111	284	1274
Mountain	356	20	28	0	0	55	0	100	409	968
Ridgeview	8	0	0	0	0	0	0	0	78	86
Quail Canyon	10	0	0	0	0	0	0	0	288	298
Del Rosa	303	3	2	0	0	0	0	2	47	357
Upper	2519	73	200	0	26	138	45	150	947	4098
Shandin Hills	62	0	0	0	0	0	0	5	11	78
Interme-diate	742	25	140	18	0	0	0	261	213	1399
Elevated	217	6	2	0	0	0	0	4	5	234
Terrace	413	140	36	0	41	60	38	12	743	1483
Lower	2657	79	1424	517	0	0	0	584	3281	8542

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Any improvements to water source facilities must consider the projected patterns of demand and the most economical way of implementation. The City will need to increase its maximum day and maximum month supply capability to meet anticipated year 2000 demands. The purpose of this chapter is to identify the quantity and location of these projected demands and to suggest alternative methods of satisfying them.

The City will need a minimum of 6 mgd additional production capability by the year 2000 and should more realistically plan on developing 10 to 15 mgd to ensure the continuation of the current level of service. This need is based on a present production capability of approximately 45,000 gpm and a predicted year 2000 maximum day water demand of approximately 52,000 gpm. The 7,000 gpm shortfall is a "worst case" condition, as Devil Canyon surface waters would be a source in addition to the 45,000 gpm, and system losses may be less than the 10 percent estimate used in this study.

SOURCES OF WATER

The City obtains its water from both ground and surface sources. For the 12-month period ending June 30, 1980, 29,500 acre-feet of water was produced, which consisted of 25,350 acre-feet of ground water and 4,150 acre-feet of surface water.

Another water source for the City is the imported supply from the State Water Project's California Aqueduct. Raw, untreated water could be taken directly from the Foothill Feeder, a 78-inch line which traverses the northerly side of San Bernardino, or indirectly by spreading the water, allowing it to rechange the underlying groundwater basin, and subsequently removing the water with wells and pumps. No State Water Project (SWP) water has ever been used directly by the City. However, in recent years the spreading of SWP water has placed considerable water into the groundwater basin, and undoubtedly a portion of the groundwater pumped by the City is SWP water.

Water sources have been classified by the City into three basic regions and they are:

- Lower
- Intermediate
- Upper

The lower region includes the Elevated, Terrace and Lower pressure zones. The annual water demand for the year 2000 is projected to be 12,380 acre-feet, and the maximum day requirement is estimated to be 18,370 gpm.

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Existing well production capacity in the lower region is approximately 19,000 gpm, hence, there is no urgent need for additional supplies at the present time. Long-term planning should include some augmentation of maximum day requirements either in the form of new wells or transfers from higher zones.

The intermediate region comprises one zone, the Intermediate Zone. The annual water consumption in the year 2000 is projected to be 2,200 acre-feet, and the maximum day requirement is estimated to be 3,880 gpm. Existing well production capacity in the intermediate region is 3,300 gpm; hence, there is no apparent need for additional supplies at the present time.

The upper region includes the following zones:

2100
1895
1720
Sycamore
Mountain
Ridgeview
Quail Canyon
Del Rosa
Upper
Shandin Hills

These zones have been included in this broad group since they lie in areas requiring hydraulic gradients of 1416 feet and higher, and it would be too energy intensive to lift water from the lower and intermediate regions.

The annual water demand for the year 2000 for the upper region is projected to be 18,080 acre-feet, and the maximum daily requirement is estimated to be 30,140 gpm. Excluding the surface diversion of Devil Canyon, the total well production capacity in the upper region is approximately 30,000 gpm. This region is the most active for land development, and plans to increase supplies should be scheduled to reflect and anticipate this situation.

EFFECTS OF DEVELOPMENT PATTERNS

The pattern of present and anticipated future land development impacts heavily on a water system. The greatest projected increase in water use is in the northwesterly portion of the City in the 1720, 1895, and 2100 Zones. It is predicted that by the year 2000, the water use in these zones will represent nearly twenty percent of the total water use in the City or approximately 6,500 acre-feet per year. Present use is 2,460 acre-feet per year in these same zones. The significance of this pattern is that the new areas of development are occurring at higher elevations (i.e., 1720 to 2100) and water will need to be provided in much larger quantities than in the past. Table 6-1 presents the projected water demands for the year 2000.

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SPECIFIC PARAMETERS (BY ZONE)

2100 Zone

The 2100 Zone is in the northwest corner of the City, bounded by the 1895 Zone to the south and the 1720 Zone to the southeast. Water from the Cajon and Vincent wells is piped via the Kendall-Irvington transmission main to serve the 2100, 1895 and the 1720 Zones. This main is tapped by a booster station which lifts the water to the Meyers Canyon Reservoir. Pipe sizes are generally 8-inch or less with the exception of a section of 12-inch pipe from the reservoir.

Maximum Day Demands

Current: 380 gpm
Future: 4030 gpm

Fire Flows

Junction	Land Use	Flow (gpm)
11	Single Family Residential	1500
13	Multiple Family Residential	2500
16	School	2500

Well-Reservoir-Booster Pump Plants

None

Wells

Cajon and Vincent Wells: Capacity: 4380 gpm - during winter
1500 gpm - during summer

Water from these two wells flows via the Kendall-Irvington transmission main and also serves the 1895 and 1720 zones.

Reservoirs

Meyers Canyon Reservoir: Capacity: 0.20 mg
Overflow Elevation: 2090 feet
Junction: 1

Booster Pumps

Meyers Canyon Booster Pump: Capacity: 1320 gpm
Junction: 10

Water Transfer Between Zones

None

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1895 Zone

The 1895 Zone is in the northwest portion of the City, bounded on the north by the 2100 Zone and on the east by the 1720 Zone. The Cajon wells pump directly to the Cajon Reservoir. There are no booster pumps. Distribution pipe sizes are generally 14-inch or less. There is also a turnout from the Kendall-Irvington transmission main.

Maximum Day Demands

Current: 1430 gpm
Future: 2300 gpm

Fire Flows

Junction	Land Use	Flow (gpm)
16	Commercial	2500
29	Single Family Residential	1500
30	Single Family Residential	1500
36	Heavy Industrial	4000
40	Single Family Residential	1500

Well-Reservoir-Booster Pump Plants

None

Wells

Cajon Well: Capacity: 2050 gpm
Junction: 6

Cajon Standby Well: Capacity: 2270 gpm
Junction: 7

Cajon and Vincent Wells: Capacity: 4380 gpm - during winter
1500 gpm - during summer

Reservoirs

Cajon Reservoir: Capacity: 0.55 mg
Overflow Elevation: 1894 feet
Junction: 12

Booster Pumps

None

Water Transfer Between Zones

Junction 38: An upstream sensitive pressure relief valve allows water to flow into the 1720 Zone.

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1720 Zone

The 1720 Zone is in the northwest portion of the City, bounded by the 1895 Zone to the west, the 2100 Zone to the northwest, the Sycamore Zone to the east, and the Upper Zone to the southeast. Water is supplied from Devil Canyon Well No. 2, a turnout from the Kendall-Irvington transmission main, a booster pump from the Sycamore Zone, and a surface water source at Devil Canyon. Waters from this surface source drain by gravity to the Devil Canyon Reservoir. Distribution pipe sizes are generally 16-inch or less with a 30-inch transmission pipe from the Palm Avenue Reservoir.

Maximum Day Demands

Current: 680 gpm
Future: 1590 gpm

Fire Flows

Junction	Land Use	Flow (gpm)
2	Single Family Residential	1500
20	School	2500
25	School	2500
39	Single Family Residential	1500
40	Single Family Residential	1500
51	Single Family Residential	1500
54	Commercial	2500
59	Single Family Residential	1500
72	School	2500
76	Single Family Residential	1500
85	Heavy Industry (Future)	4000
87	Light Industrial (Future)	3500

Well-Reservoir-Booster Pump Plants

None

Wells

Devil Canyon No. 2: Capacity: 960 gpm
Junction: 95

Reservoirs

College Reservoir: Capacity: 2.5 mg
Overflow Elevation: 1720 feet
Junction: 10

Palm Avenue Reservoir: Capacity: 0.33 mg
Overflow Elevation: 1720 feet
Junction: 1

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1720 Zone (continued)

Booster Pumps

Located near Devil Canyon	Capacity: 5000 gpm (two pumps)
Well No. 1 (in Sycamore Zone):	Junction: 19

Water Transfer Between Zones

None

Special Demands

Junction 20: 900 gpm is delivered to the California State University during periods of fire flow.

Junction 85: 170 gpm is delivered to Culligan during periods of fire flow.

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Sycamore Zone

The Sycamore Zone is in the north central part of the City. It is bordered by the Upper Zone to the south, the 1720 Zone to the west, and the Mountain Zone to the east. Water is supplied from Devil Canyon Well No. 1 and from the Ellena Brothers Well. A booster pump draws from the Newmark Reservoir and feeds two reservoirs within the zone, and a second booster pump draws from the 24-inch pipe on 48th Street, which also is supplied by the Newmark Reservoir. Distribution pipe sizes are generally 8-inch and less.

Maximum Day Demands

Current: 3250 gpm
Future: 3300 gpm

Fire Flows

Junction	Land Use	Flow (gpm)
15	School	2500
34	Commercial	2500
38	Single Family Residential	1500
69	Commercial	2500
73	Single Family Residential	1500
74	Single Family Residential	1500
79	School	2500

Well-Reservoir-Booster Pump Plants

None

Wells

Devil Canyon Well No. 1: Capacity: 1480 gpm
Junction: 82

Ellena Bros. Well: Capacity: 1320 gpm

Reservoirs

Sycamore Reservoir No. 1: Capacity: 2.5 mg
Overflow Elevation: 1580 feet
Junction: 24

Sycamore Reservoir No. 2: Capacity: 0.45 mg
Overflow Elevation: 1580 feet
Junction: 1

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Sycamore Zone (continued)

Booster Pumps

Sycamore Booster Pump No. 1:	Capacity:	1800 gpm
	Junction:	30
Sycamore Booster Pump No. 2:	Capacity:	2100 gpm
	Junction:	3

Water Transfer Between Zones

Junction 81: Booster pumps can deliver 5000 gpm to the 1720 Zone.

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Mountain Zone

The Mountain Zone is in the north central part of the City. It is bordered by the Upper Zone on the south, the Sycamore Zone on the west, and Ridgeview and Del Rosa Zones on the east. A booster pump station located in the Upper Zone fills two Mountain Zone reservoirs. Distribution pipe sizes are generally 8-inch and less.

Maximum Day Demands

Current: 2000 gpm
Future: 2000 gpm

Fire Flows

Junction	Land Use	Flow (gpm)
1	Single Family Residential	1500
7	Single Family Residential	1500
41	Single Family Residential	1500
45	Commercial	2500
52	Single Family Residential	1500

Well-Reservoir-Booster Pump Plants

None

Wells

None

Reservoirs

Mountain Reservoir No. 1:
Capacity: 0.22 mg
Overflow Elevation: 1633 feet
Junction: 9

Mountain Reservoir No. 2:
Capacity: 2.0 mg
Overflow Elevation: 1633 feet
Junction: 10

Booster Pumps

Mountain Booster Pump:
Capacity: 2990 gpm (three pumps)
Junction: 18

Water Transfer Between Zones

None

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Ridgeview Zone

The Ridgeview Zone is in the northeast part of the City, bounded by the Quail Canyon Zone to the east, the Mountain Zone to the west, and the Del Rosa Zone to the south. Water for the Ridgeview Zone is supplied, via a booster pump, from the Del Rosa Zone. Distribution pipe sizes are 8-inch and smaller.

Maximum Day Demands

Current: 120 gpm
Future: 160 gpm

Fire Flows

Junction	Land Use	Flow (gpm)
3	Single Family Residential	1500
8	Single Family Residential	1500

Well-Reservoir-Booster Pump Plants

None

Wells

None

Reservoirs

Ridgeview Reservoir:
Capacity: 0.32 mg
Overflow Elevation: 1736 feet
Junction: 1

Booster Pumps

Ridgeview Booster Pump:
Capacity: 490 gpm
Junction: 6

Water Transfer Between Zones

None

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Quail Canyon Zone

The Quail Canyon Zone is in the northeast part of the City, bounded by the Ridgeview Zone to the west and the Del Rosa Zone to the south. Water for the Quail Canyon Zone is supplied, via a booster pump, from the Del Rosa Zone. Distribution pipe sizes are 8-inch or less, except for two pipes.

Maximum Day Demands

Current: 320 gpm
Future: 390 gpm

Fire Flows

Junction	Land Use	Flow (gpm)
5	Single Family Residential	1500
12	Single Family Residential	1500
17	Single Family Residential	1500

Well-Reservoir-Booster Pump Plants

None

Wells

None

Reservoirs

Quail Canyon Reservoir No. 1:
Capacity: 0.04 mg
Overflow Elevation: 1776 feet
Junction: 6

Quail Canyon Reservoir No. 2:
Capacity: 0.04 mg
Overflow Elevation: 1776 feet
Junction: 7

Daley Canyon Reservoir:
Capacity: 1.5 mg
Overflow Elevation: 1775 feet
Junction: 20

Booster Pumps

Quail Canyon Booster Pump:
Capacity: 1010 gpm (two pumps)
Junction: 13

Water Transfers Between Zones

None

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Del Rosa Zone

The Del Rosa Zone is in the northeast portion of the City, bordered by the Quail Canyon and Ridgeview Zones on the north, and the Mountain and Upper Zones on the west. A booster pump located in the Upper Zone transfers water to the two reservoirs in the Del Rosa Zone. Distribution pipe sizes are generally 8-inch in diameter and less.

Maximum Day Demands

Current: 1230 gpm
Future: 1400 gpm

Fire Flows

Junction	Land Use	Flow (gpm)
4	Multiple Family Residential	2500
9	Single Family Residential	1500
33	Multiple Family Residential	2500
39	Single Family Residential	1500

Well-Reservoir-Booster Pump Plants

None

Wells

None

Reservoirs

Del Rosa No. 1: Capacity: 0.46 mg
Overflow Elevation: 1513 feet
Junction: 14

Del Rosa No. 2: Capacity: 0.19 mg
Overflow Elevation: 1513 feet
Junction: 1

Booster Pumps

Del Rosa Booster Pump: Capacity: 3250 gpm (two pumps)
Junction: 2

Water Transfer Between Zones

Junction 14: Booster pumps can deliver 1010 gpm to Quail Canyon Zone.
Junction 40: A booster pump can delivers 490 gpm to Ridgeview Zone.

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Upper Zone (includes Shandin Hills Zone)

The Upper Zone is in the north central portion of the City. It is the largest zone in terms of present demand. Well fields in Devil Canyon and in the Newmark area feed the Newmark Reservoir. The Electric Drive Reservoir is fed from wells and plants within the zone. Pipe size is typical of a large service area, varying in diameter from 30-inch to 6-inch pipes. Water is supplied to the Shandin Hills Zone from the Shandin Booster Pump which is located on Circle Road at Hillhurst Drive. Also immediately adjacent to, and west of, the Upper Zone is the Mallory area. This area, which has approximately 60 homes, is served by a small isolated hydropneumatic system which is supplied by a groundwater well.

Maximum Day Demands

Current: 14,740 gpm
Future: 14,970 gpm

Fire Flows

Junction	Land Use	Flow (gpm)
2	Single Family Residential	1500
20	School	2500
31	Single Family Residential	1500
13	Commercial	2500
42	Heavy Industrial	4000
84	Heavy Industrial	4000
90	School	2500
97	Single Family Residential	1500
196	Multiple Family Residential	2500
211	Multiple Family Residential	2500

Well-Reservoir-Booster Pump Plants

Lynwood Plant:
Well Capacity: 1700 gpm (one well)
Booster Capacity: 2060 gpm (one pump)
Junction: 208

"E" Street Plant:
Well Capacity: 3580 gpm (two wells)
("E" Street Well: 1700 gpm)
(23rd and "E" Street Well: 1880 gpm)
Booster Capacity: 3890 gpm (three pumps)
Junction: 119

27th Street Plant:
Well Capacity: 1580 gpm (one well)
Booster Capacity: 1660 gpm (one pump)
Junction: 114

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Upper Zone (continued)

19th Street Plant:	Well Capacity: 3700 gpm (three wells) (19th Street Well No. 1: 1470 gpm) (19th Street Well No. 2: 1220 gpm) (Mt. Vernon Well: 1010 gpm, Junction 4) Booster Capacity: 4840 gpm (two pumps) Junction: 11
30th Street Plant:	Well Capacity: 3730 gpm (two wells) (30th and Mt. View Well: 1300 gpm) (31st and Mt. View Well: 2430 gpm) Booster Capacity: 3510 gpm (two pumps) Junction: 150

Wells

Newmark Wells:	Capacity: 5600 gpm (four wells) (1100, 1290, 1450, and 1760 gpm) Note: All four wells pump directly into Newmark Reservoir, Junction 217.

Reservoirs

Newmark Reservoir:	Capacity: 22.9 mg Overflow Elevation: 1415 feet Junction: 217
Electric Drive Reservoir:	Capacity: 8.0 mg Overflow Elevation: 1415 feet Junction: 218

Booster Pumps

Waterman Booster Pump: Junction: 190	Capacity: 5310 gpm (two pumps)

Water Transfer Between Zones

Junction 204:	Booster pumps can deliver 3250 gpm to the Del Rosa Zone and subsequently to the Ridgeview and Quail Canyon Zones. However, delivery to the Del Rosa Zone is limited to 2000 gpm during periods of fire flow.
Junction 218:	Booster pumps can deliver 2990 gpm to the Mountain Zone.
Junction 91:	A booster pump can deliver 190 gpm to the Shandin Hills Zone.

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Upper Zone (continued)

Junction 127: 2500 gpm can be transferred through a pressure reducing valve to the Intermediate Zone.

Junction 202: 1000 gpm can be transferred through a pressure reducing valve to the Intermediate Zone.

Junction 14: 1800 gpm can be transferred through a pressure reducing valve to the Lower Zone.

Junction 60: 1500 gpm can be transferred through a pressure reducing valve to the Lower Zone.

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Intermediate Zone

The Intermediate Zone is in the east central portion of the City, bounded on the north and west by the Upper Zone and on the south by the Lower Zone. The Perris Hill Plant and the 16th Street Plant deliver water to the Perris Hill Reservoir. Distribution piping ranges from 20-inch to 6-inch.

Maximum Day Demands

Current: 3880 gpm
Future: 3880 gpm

Fire Flows

Junction	Land Use	Flow (gpm)
3	School	2500
11	School	2500
26	Single Family Residential	1500
32	Single Family Residential	1500
45	Hospital	3000
68	School	2500

Well-Reservoir-Booster Pump Plants

Perris Hill Plant:
Well Capacity: 1400 gpm (one well)
Booster Capacity: 1590 gpm (one pump)
Junction: 30

16th Street Plant:
Well Capacity: 1920 gpm (one well)
Booster Capacity: 2680 gpm (one pump)
Junction: 51

Wells

None

Reservoirs

Perris Hill Reservoir:
Capacity: 10.0 mg
Overflow Elevation: 1311 feet
Junction: 11

Booster Pumps

None

Water Transfer Between Zones

None

Note: Water is available from the Upper Zone at Junctions 25 and 80, via pressure reducing valves.

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Elevated Zone

The Elevated Zone is in the southwest part of the City, bounded on the south by the Terrace Zone and on the east by the Lower Zone. Water from the Lytle Creek Reservoir is boosted to the Elevated Reservoir. Distribution pipe sizes are 12-inch or less.

Maximum Day Demands

Current: 950 gpm
Future: 950 gpm

Fire Flows

Junction	Land Use	Flow (gpm)
1	Single Family Residential	1500
3	Single Family Residential	1500
7	Commercial	2500
22	Single Family Residential	1500
23	Single Family Residential	1500

Well-Reservoir-Booster Pump Plants

None

Wells

None

Reservoirs

Elevated Reservoir: Capacity: 0.1 mg
Overflow Elevation: 1383 feet
Junction: 8

Booster Pumps

Elevated Booster Pump: Capacity: 1160 gpm.

Note: A 1390 gpm auxiliary booster also serves the Terrace Zone.

Water Transfer Between Zones

None

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Exhibit 92

State of California—Environmental Protection Agency
Form Approved OMB No. 2050-0039 (Expires 9-30-94)
Please print or type. Form designed for use on elite (12-pitch) typewriter.

See Instructions on back page 6.

Department of Toxic Substances Control
Sacramento, California

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. | Manifest Document No. | 2. Page 1 of 1

Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
SAN BERNARDINO WATER DIST.
300 [illegible] BASE RD., SAN BERNARDINO, CA 92408

4. Generator's Phone (909) 384-5303

5. Transporter 1 Company Name: HAZPAK, INC.
6. US EPA ID Number: CAD982364960

7. Transporter 2 Company Name
8. US EPA ID Number

9. Designated Facility Name and Site Address
[illegible] DISTRICT RECOVERY SERVICES
31[illegible] EAST PICO BLVD.
LOS ANGELES, CA 90023
10. US EPA ID Number: CAD008252605

State Manifest Document Number

11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	Waste Number
a. WASTE TRICHLOROETHYLENE 6.1, UN1710, PGIII (F002/D040)	001	DM	0000	G	[illegible]
b.					
c.					
d.					

15. Special Handling Instructions and Additional Information
EMERGENCY RESPONSE: HAZPAK, INC. 909-273-0550

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of the consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable federal, state and international laws.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: Pentre C. Clinton | Signature | Month 05 Day 24 Year 94

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: JOSEPH R. TAIA | Signature | Month 05 Day 24 Year 94

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name | Signature | Month | Day | Year

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name: MARK RUSSELL | Signature | Month 05 Day 24 Year 94

GENERATOR | TRANSPORTER | FACILITY

IN CASE OF EMERGENCY OR SPILL, CALL THE NATIONAL RESPONSE CENTER 1-800-424-8802; WITHIN CALIFORNIA, CALL 1-800-852-7550

DO NOT WRITE BELOW THIS LINE.

CITY06209

DEFENDANTS' EXHIBIT 552 FOR ID
BRYAN LUI, CSR NO. 11223
DATE: 6-10-99
WITNESS: STEJSKAL, V.II

DTSC 8022A (7/92)
EPA 8700—22

Yellow: TSDF SENDS THIS COPY TO GENERATOR WITHIN 30 DAYS. (Generators who submit hazardous waste for transport out-of-state, produce completed copy of this copy and send to DTSC within 30 days.)

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Exhibit 93

Thomas N. Jacobson, State Bar #55127
Penelope Alexander-Kelley, State Bar #145129
Lisa Stolzy, State Bar #198409
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Russell V. Randle
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Washington, D.C. 20037
Telephone No.: (202) 457-6000
Facsimile No.: (202) 457-6315

Attorneys for CITY OF SAN BERNARDINO
MUNICIPAL WATER DEPARTMENT

UNITED STATES DISTRICT COURT

CENTRAL DISTRICT OF CALIFORNIA

STATE OF CALIFORNIA, on behalf of the California Department of Toxic Substances Control, Plaintiff, vs. UNITED STATES OF AMERICA, DEPARTMENT OF THE ARMY, and DOES, Defendants.	CASE NO. CV 96-5205 MRP (JGx) CASE NO. CV 96-8867 MRP (JGx) (Consolidated cases) **PLAINTIFF CITY OF SAN BERNARDINO MUNICIPAL WATER DEPARTMENT'S RESPONSE TO DEFENDANT'S THIRD SET OF REQUESTS FOR ADMISSION** Judge: The Honorable Mariana R. Pfaelzer
THE CITY OF SAN BERNARDINO MUNICIPAL WATER DEPARTMENT, Plaintiff, vs. UNITED STATES OF AMERICA, DEPARTMENT OF THE ARMY, and DOES, Defendants.	

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ORIGINAL

GENERAL OBJECTIONS

A. This response to Defendant's Third Set of Requests for Admission is submitted on behalf of the City of San Bernardino, Municipal Water Department ("responding party" or the "City"). Responding party objects to the "Definitions" and "Instructions" stated in Defendant's Third Set of Requests for Admission to the extent that would impose any obligations on the City beyond or at variance with the specific requirements of Fed. R. Civ. P. 36 and such other provisions of the Federal Rules that apply to a party responding to requests for admission.

B. With regard to Requests for Admission Nos. 1018-1047, the City has been compelled to interpose specific objections due to the ambiguity of the Requests. The City also generally objects to those Requests to the extent that their wording could, in some cases, cause the City's responses to be read as denying or otherwise repudiating the factual accuracy, authenticity, relevance, or materiality of documentary evidence in this proceeding concerning the composition of certain products that were in use by the Army or available for use by the Army during the World War II era. The City's responses to Requests 1018-1047, consequently, are made without prejudice to such documents and/or the City's right to use them for all permissible evidentiary purposes in this proceeding. The specific Requests for which this is a concern are identified by a specific reference to these General Objections

RESPONSES TO REQUESTS FOR ADMISSION

REQUEST FOR ADMISSION NO. 683:

The Shandin Hills Airport, 27th & Mt. Vernon, is a potentially responsible party ("PRP") for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 683:

Deny that the City considers the Shandin Hills Airport, 27th & Mt. Vernon, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 684:

The City has not investigated whether activities at the Shandin Hills Airport caused the Newmark-Muscoy groundwater contamination.

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RESPONSE TO REQUEST FOR ADMISSION NO. 684:

Admit.

REQUEST FOR ADMISSION NO. 685:

The City has not investigated whether activities at the Shandin Hills Airport contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 685:

Admit.

REQUEST FOR ADMISSION NO. 686:

The San Bernardino Airport, 900 W. 42nd Street, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 686:

Deny that the City considers the San Bernardino Airport, 900 W. 42nd Street, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 687:

The City has not investigated whether activities at the San Bernardino Airport caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 687:

Admit.

REQUEST FOR ADMISSION NO. 688:

The City has not investigated whether activities at the San Bernardino Airport contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 688:

Admit.

REQUEST FOR ADMISSION NO. 689:

Stinson Authorized Sales and Service, 900 W. 42nd Street, is a PRP for the Newmark-Muscoy groundwater contamination.

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RESPONSE TO REQUEST FOR ADMISSION NO. 689:

Deny that the City considers the Stinson Authorized Sales and Service, 900 W. 42nd Street, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 690:

The City has not investigated whether activities at Stinson Authorized Sales and Service caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 690:

Admit.

REQUEST FOR ADMISSION NO. 691:

The City has not investigated whether activities at Stinson Authorized Sales and Service contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 691:

Admit.

REQUEST FOR ADMISSION NO. 692:

Aircraft Repair, 3696 Vermont Street, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 692:

Deny that the City considers Aircraft Repair, 3696 Vermont Street, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 693:

The City has not investigated whether activities at Aircraft Repair caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 693:

Admit.

REQUEST FOR ADMISSION NO. 694:

The City has not investigated whether activities at Aircraft Repair caused the Newmark-Muscoy groundwater contamination.

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RESPONSE TO REQUEST FOR ADMISSION NO. 694:

Admit.

REQUEST FOR ADMISSION NO. 695:

Alvin's Sierra Way Garage, 4161 N. Sierra Way, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 695:

Deny that the City considers Alvin's Sierra Way Garage, 4161 N. Sierra Way, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 696:

The City has not investigated whether activities at Alvin's Sierra Way Garage caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 696:

Admit.

REQUEST FOR ADMISSION NO. 697:

The City has not investigated whether activities at Alvin's Sierra Way Garage contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 697:

Admit.

REQUEST FOR ADMISSION NO. 698:

Dudley's Auto Service, 3997 N. Sierra Way, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 698:

Deny that the City considers Dudley's Auto Service, 3997 N. Sierra Way, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 699:

The City has not investigated whether activities at Dudley's Auto Service caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 699:

Admit.

REQUEST FOR ADMISSION NO. 700:

The City has not investigated whether activities at Dudley's Auto Service contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 700:

Admit.

REQUEST FOR ADMISSION NO. 701:

German Auto Haus, 596 W. 40th Street, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 701:

Deny that the City considers German Auto Haus, 596 W. 40th Street, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 702:

The City has not investigated whether activities at German Auto Haus caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 702:

Admit.

REQUEST FOR ADMISSION NO. 703:

The City has not investigated whether activities at German Auto Haus contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 703:

Admit.

REQUEST FOR ADMISSION NO. 704:

Glenn's Auto Repair, 331 W. 40th Street, is a PRP for the Newmark-Muscoy groundwater contamination.

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RESPONSE TO REQUEST FOR ADMISSION NO. 704:

Deny that the City considers Glenn's Auto Repair, 331 W. 40th Street, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 705:

The City has not investigated whether activities at Glenn's Auto Repair caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 705:

Admit.

REQUEST FOR ADMISSION NO. 706:

The City has not investigated whether activities at Glenn's Auto Repair contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 706:

Admit.

REQUEST FOR ADMISSION NO. 707:

Ike's D & I Automotive, 3308 N. E Street, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 707:

Deny that the City considers Ike's D & I Automotive, 3308 N. E Street, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 708:

The City has not investigated whether activities at Ike's D & I Automotive caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 708:

Admit.

REQUEST FOR ADMISSION NO. 709:

The City has not investigated whether activities at Ike's D & I Automotive contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 709:

Admit.

REQUEST FOR ADMISSION NO. 710:

Lester's Auto Repair, 3610 Cajon, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 710:

Deny that the City considers Lester's Auto Repair, 3610 Cajon, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 711:

The City has not investigated whether activities at Lester's Auto Repair caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 711:

Admit.

REQUEST FOR ADMISSION NO. 712:

The City has not investigated whether activities at Lester's Auto Repair contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 712:

Admit.

REQUEST FOR ADMISSION NO. 713:

"Rod's Auto Service,"3196 N. E Street, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 713:

Deny that the City considers "Rod's Auto Service," 3196 N. E Street, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 714:

The City has not investigated whether activities at Rod's Auto Service caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 714:

Admit.

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REQUEST FOR ADMISSION NO. 715:

The City has not investigated whether activities at Rod's Auto Service contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 715:

Admit.

REQUEST FOR ADMISSION NO. 716:

Advanced Auto Body Shop, 3550 Cajon, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 716:

Deny that the City considers Advanced Auto Body Shop, 3550 Cajon, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 717:

The City has not investigated whether activities at Advanced Auto Body Shop caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 717:

Admit.

REQUEST FOR ADMISSION NO. 718:

The City has not investigated whether activities at Advanced Auto Body Shop contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 718:

Admit.

REQUEST FOR ADMISSION NO. 719:

Contemporary Paint and Body Shop, 3550 Cajon, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 719:

Deny that the City considers Contemporary Paint and Body Shop, 3550 Cajon, to be a PRP at this time.

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REQUEST FOR ADMISSION NO. 720:

The City has not investigated whether activities at Contemporary Paint and Body Shop caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 720:

Admit.

REQUEST FOR ADMISSION NO. 721:

The City has not investigated whether activities at Contemporary Paint and Body Shop contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 721:

Admit.

REQUEST FOR ADMISSION NO. 722:

J & M Paint & Body Shop, 3550 Cajon, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 722:

Deny that the City considers J & M Paint & Body Shop, 3550 Cajon, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 723:

The City has not investigated whether activities at J & M Paint and Body Shop caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 723:

Admit.

REQUEST FOR ADMISSION NO. 724:

The City has not investigated whether activities J & M Paint and Body Shop contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 724:

Admit.

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REQUEST FOR ADMISSION NO. 725:

Bruce's Garage & Towing Service, 19407 Cajon, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 725:

Deny that the City considers Bruce's Garage & Towing Service, 19407 Cajon, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 726:

The City has not investigated whether activities at Bruce's Garage & Towing caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 726:

Admit.

REQUEST FOR ADMISSION NO. 727:

The City has not investigated whether activities at Bruce's Garage & Towing contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 727:

Admit.

REQUEST FOR ADMISSION NO. 728:

Reave's Service, 4009 N. Sierra Way, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 728:

Deny that the City considers Reave's Service, 4009 N. Sierra Way, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 729:

The City has not investigated whether activities at Reave's Service caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 729:

Admit.

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REQUEST FOR ADMISSION NO. 730:

The City has not investigated whether activities at Reave's Service contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 730:

Admit.

REQUEST FOR ADMISSION NO. 731:

Parker's Auto Service, 3610 Cajon, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 731:

Deny that the City considers Parker's Auto Service, 3610 Cajon, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 732:

The City has not investigated whether activities at Parker's Auto Service caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 732:

Admit.

REQUEST FOR ADMISSION NO. 733:

The City has not investigated whether activities at Parker's Auto Service contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 733:

Admit.

REQUEST FOR ADMISSION NO. 734:

Sierra Way Auto, 3997 N. Sierra Way, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 734:

Deny that the City considers Sierra Way Auto, 3997 N. Sierra Way, to be a PRP at this time.

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REQUEST FOR ADMISSION NO. 735:

The City has not investigated whether activities at Sierra Way Auto caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 735:

Admit.

REQUEST FOR ADMISSION NO. 736:

The City has not investigated whether activities at Sierra Way Auto contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 736:

Admit.

REQUEST FOR ADMISSION NO. 737:

Chick's Garage, 598 W. 42nd Street, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 737:

Deny that the City considers Chick's Garage, 598 W. 42nd Street, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 738:

The City has not investigated whether activities at Chick's Garage caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 738:

Admit.

REQUEST FOR ADMISSION NO. 739:

The City has not investigated whether activities at Chick's Garage contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 739:

Admit.

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REQUEST FOR ADMISSION NO. 740:

Boulevard Cleaners, 3267 N. E Street, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 740:

Deny that the City considers Boulevard Cleaners, 3267 N. E Street, to be a PRP at this time..

REQUEST FOR ADMISSION NO. 741:

The City has not investigated whether activities at Boulevard Cleaners caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 741:

Admit.

REQUEST FOR ADMISSION NO. 742:

The City has not investigated whether activities at Boulevard Cleaners contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 742:

Admit.

REQUEST FOR ADMISSION NO. 743:

Effie's cleaners, 2175 N. Sierra Way, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 743:

Deny that the City considers Effie's cleaners, 2175 N. Sierra Way, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 744:

The City has not investigated whether activities at Effie's cleaners caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 744:

Admit.

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REQUEST FOR ADMISSION NO. 745:

The City has not investigated whether activities at Effie's cleaners contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 745:

Admit.

REQUEST FOR ADMISSION NO. 746:

Esquire Cleaners, 2140 N.E. Street, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 746:

Deny that the City considers Esquire Cleaners, 2140 N.E. Street, be a PRP at this time.

REQUEST FOR ADMISSION NO. 747:

The City has not investigated whether activities at Esquire Cleaners caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 747:

Admit.

REQUEST FOR ADMISSION NO. 748:

The City has not investigated whether activities at Esquire Cleaners contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 748:

Admit.

REQUEST FOR ADMISSION NO. 749:

Ideal Cleaners, 4352 N. Sierra Way, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 749:

Deny that the City considers Ideal Cleaners, 4352 N. Sierra Way, to be a PRP at this time.

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REQUEST FOR ADMISSION NO. 750:

The City has not investigated whether activities at Ideal Cleaners, 4352 N. Sierra Way, caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 750:

Admit.

REQUEST FOR ADMISSION NO. 751:

The City has not investigated whether activities at Ideal Cleaners, 4352 N. Sierra Way, contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 751:

Admit.

REQUEST FOR ADMISSION NO. 752:

Ideal Cleaners, 2175 N. Sierra Way, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 752:

Deny that the City considers Ideal Cleaners, 2175 N. Sierra Way, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 753:

The City has not investigated whether activities at Ideal Cleaners, 2175 N. Sierra Way, caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 753:

Admit.

REQUEST FOR ADMISSION NO. 754:

The City has not investigated whether activities at Ideal Cleaners, 2175 N. Sierra Way, contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 754:

Admit.

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REQUEST FOR ADMISSION NO. 755:

Sahara Cleaners, 201 E. 40th, Street, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 755:

Deny that the City considers Sahara Cleaners, 201 E. 40th, Street, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 756:

The City has not investigated whether activities at Sahara Cleaners, 201 E. 40th Street, caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 756:

Admit.

REQUEST FOR ADMISSION NO. 757:

The City has not investigated whether activities at Sahara Cleaners, 201 E. 40th Street contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 757:

Admit.

REQUEST FOR ADMISSION NO. 758:

Sahara Cleaners 264 E. 40th Street, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 758:

Deny that the City considers Sahara Cleaners 264 E. 40th Street, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 759:

The City has not investigated whether activities at Sahara Cleaners, 264 E. 40th Street, caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 759:

Admit.

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REQUEST FOR ADMISSION NO. 760:

The City has not -investigated whether activities at Sahara Cleaners, 264 E. 40th Street, contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 760:

Admit.

REQUEST FOR ADMISSION NO. 761:

North End Laundry and Dry Cleaners, 44 W. 40th Street, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 761:

Deny that the City considers North End Laundry and Dry Cleaners, 44 W. 40th Street, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 762:

The City has not investigated whether activities at North End Laundry and Dry Cleaners caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 762:

Admit.

REQUEST FOR ADMISSION NO. 763:

The City has not investigated whether activities at North End Laundry and Dry Cleaners contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 763:

Admit.

REQUEST FOR ADMISSION NO. 764:

One Hour Martinizing, 170 E. 40th Street, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 764:

Deny that the City considers One Hour Martinizing, 170 E. 40th Street, to be a PRP at this time.

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REQUEST FOR ADMISSION NO. 765:

The City has not investigated whether activities at One Hour Martinizing caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 765:

Admit.

REQUEST FOR ADMISSION NO. 766:

The City has not investigated whether activities at One Hour Martinizing contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 766:

Admit.

REQUEST FOR ADMISSION NO. 767:

Royal Cleaners & Laundry, 267 E. 40th Street, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 767:

Deny that the City considers Royal Cleaners & Laundry, 267 E. 40th Street, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 768:

The City has not investigated whether activities at Royal Cleaners & Laundry caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 768:

Admit.

REQUEST FOR ADMISSION NO. 769:

The City has not investigated whether activities at Royal Cleaners & Laundry contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 769:

Admit.

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REQUEST FOR ADMISSION NO. 770:

College Park Cleaners, 974 W. Kendall, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 770:

Deny that the City considers College Park Cleaners, 974 W. Kendall, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 771:

The City has not investigated whether activities at College Park Cleaners caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 771:

Admit.

REQUEST FOR ADMISSION NO. 772:

The City has not investigated whether activities at College Park Cleaners contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 772:

Admit.

REQUEST FOR ADMISSION NO. 773:

Norge Equipped Laundry and Cleaning Village, 444 W. Highland, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 773:

Deny that the City considers Norge Equipped Laundry and Cleaning Village, 444 W. Highland, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 774:

The City has not investigated whether activities at Norge Equipped Laundry and Cleaning Village caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 774:

Admit.

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REQUEST FOR ADMISSION NO. 775:

The City has not investigated whether activities at Norge Equipped Laundry and Cleaning Village contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 775:

Admit.

REQUEST FOR ADMISSION NO. 776:

Sierra Laundry and Dry Cleaners, 2175 Sierra Way, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 776:

Deny that the City considers Sierra Laundry and Dry Cleaners, 2175 Sierra Way, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 777:

The City has not investigated whether activities at Sierra Laundry and Dry Cleaners caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 777:

Admit.

REQUEST FOR ADMISSION NO. 778:

The City has not investigated whether activities at Sierra Laundry and Dry Cleaners contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 778:

Admit.

REQUEST FOR ADMISSION NO. 779:

Abbott Machine & Welding, 337 W. 40th Street, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 779:

Deny that the City considers Abbott Machine & Welding, 337 W. 40th Street, to be a PRP at this time.

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REQUEST FOR ADMISSION NO. 780:

The City has not investigated whether activities at Abbott Machine & Welding caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 780:

Admit.

REQUEST FOR ADMISSION NO. 781:

The City has not investigated whether activities at Abbott Machine & Welding contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 781:

Admit.

REQUEST FOR ADMISSION NO. 782:

Anco machine shop, 19851 Cajon, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 782:

Deny that the City considers Anco machine shop, 19851 Cajon, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 783:

The City has not investigated whether activities at Anco caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 783:

Admit.

REQUEST FOR ADMISSION NO. 784:

The City has not investigated whether activities at Anco contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 784:

Admit.

REQUEST FOR ADMISSION NO. 785:

Walter F. G. & Son, 5770 Industrial Parkway, is a PRP for the Newmark-Muscoy groundwater contamination.

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RESPONSE TO REQUEST FOR ADMISSION NO. 785:

Deny that the City considers Walter F. G. & Son, 5770 Industrial Parkway, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 786:

The City has not investigated whether activities at Walter F.G. & Son caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 786:

Admit.

REQUEST FOR ADMISSION NO. 787:

The City has not investigated whether activities at Walter F.G. & Son contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 787:

Admit.

REQUEST FOR ADMISSION NO. 788:

Refrigeration Service Co., 592 W. 40th Street, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 788:

Deny that the City considers Refrigeration Service Co., 592 W. 40th Street, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 789:

The City has not investigated whether activities at Refrigeration Service Co. caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 789:

Admit.

REQUEST FOR ADMISSION NO. 790:

The City has not investigated whether activities at Refrigeration Service Co. contributed to the Newmark-Muscoy groundwater contamination.

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RESPONSE TO REQUEST FOR ADMISSION NO. 790:

Admit.

REQUEST FOR ADMISSION NO. 791:

Ansco Steel Company, 20225 Kendall, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 791:

Deny that the City considers Ansco Steel Company, 20225 Kendall, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 792:

The City has not investigated whether activities at Ansco Steel Company caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 792:

Admit.

REQUEST FOR ADMISSION NO. 793:

The City has not investigated whether activities at Ansco Steel Company contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 793:

Admit.

REQUEST FOR ADMISSION NO. 794:

Armor Rolling Mill, 20225 Kendall, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 794:

Deny that the City considers Armor Rolling Mill, 20225 Kendall, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 795:

The City has not investigated whether activities at Armor Rolling Mill caused the Newmark-Muscoy groundwater contamination.

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RESPONSE TO REQUEST FOR ADMISSION NO. 795:

Admit.

REQUEST FOR ADMISSION NO. 796:

The City has not investigated whether activities at Armor Rolling Mill contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 796:

Admit.

REQUEST FOR ADMISSION NO. 797:

Alden, 2022S Kendall, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 797:

Deny that the City considers Alden, 2022S Kendall, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 798:

The City has not investigated whether activities at Alden caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 798:

Admit.

REQUEST FOR ADMISSION NO. 799:

The City has not investigated whether activities at Alden contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 799:

Admit.

REQUEST FOR ADMISSION NO. 800:

Portofab, 1300 W. 48th, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 800:

Deny that the City considers Portofab, 1300 W. 48th, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 801:

The City has not investigated whether activities at Portofab caused the Newmark-Muscoy groundwater contamination.

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RESPONSE TO REQUEST FOR ADMISSION NO. 801:

Admit.

REQUEST FOR ADMISSION NO. 802:

The City has not investigated whether activities at-Portofab contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 802:

Admit.

REQUEST FOR ADMISSION NO. 803:

Scott Specialty Gases, 2600 Cajon, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 803:

Deny that the City considers Scott Specialty Gases, 2600 Cajon, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 804:

The City has not investigated whether activities at Scott Specialty Gases caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 804:

Admit.

REQUEST FOR ADMISSION NO. 805:

The City has not investigated whether activities at Scott Specialty Gases contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 805:

Admit.

REQUEST FOR ADMISSION NO. 806:

Unicorn Abrasives & Supply Company, 3552 Cajon, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 806:

Deny that the City considers Unicorn Abrasives & Supply Company, 3552 Cajon, to be a PRP at this time.

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REQUEST FOR ADMISSION NO. 807:

The City has not investigated whether activities at Uniform Abrasives & Supply Company caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 807:

Admit.

REQUEST FOR ADMISSION NO. 808:

The City has not investigated whether activities at Uniform Abrasives and Supply Company contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 808:

Admit.

REQUEST FOR ADMISSION NO. 809:

Junk Yard, west side of Cajon, opposite Industrial Parkway, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 809:

Deny that the City considers Junk Yard, west side of Cajon, opposite Industrial Parkway, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 810:

The City has not investigated whether activities at Junk Yard, west side of Cajon, opposite Industrial Parkway, caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 810:

Admit.

REQUEST FOR ADMISSION NO. 811:

The City has not investigated whether activities at Junk Yard, west site of Cajon, opposite Industrial Parkway, contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 811:

Admit.

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REQUEST FOR ADMISSION NO. 812:

A & A Manufacturing, 17760 Cajon, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 812:

Deny that the City considers A & A Manufacturing, 17760 Cajon, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 813:

The City has not investigated whether activities at A & A Manufacturing caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 813:

Admit.

REQUEST FOR ADMISSION NO. 814:

The City has not investigated whether activities at A & A Manufacturing contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 814:

Admit.

REQUEST FOR ADMISSION NO. 815:

Potter Residence, 19346 Kendall, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 815:

Deny that the City considers Potter Residence, 19346 Kendall, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 816:

The City has not investigated whether activities at the Potter Residence caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 816:

Admit.

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REQUEST FOR ADMISSION NO. 817:

The City has not investigated whether activities at the Potter Residence contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 817:

Admit.

REQUEST FOR ADMISSION NO. 818:

J. Putnam Henck, 550 E. 40th Street, is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 818:

Deny that the City considers J. Putnam Henck, 550 E. 40th Street, to be a PRP at this time.

REQUEST FOR ADMISSION NO. 819:

The City has not investigated whether activities at J. Putnam Henck caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 819:

Admit.

REQUEST FOR ADMISSION NO. 820:

The City has not investigated whether activities at J. Putnam Henck contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 820:

Admit.

REQUEST FOR ADMISSION NO. 821:

Joseph F. Stejskal, Director, Engineering-Construction-Maintenance, San Bernardino Water Department sent a letter to Mr. James W. Anderson, Executive Officer, California Regional Water Quality Control Board, Santa Ana Region, dated June 25, 1985 from on June 27, 1985 [sic].

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RESPONSE TO REQUEST FOR ADMISSION NO. 821:

Objection: the request is vague and misleading. Notwithstanding that objection and assuming that the request refers to a June 25, 1985, letter from Mr. Stejskal to Mr. Anderson, admit.

REQUEST FOR ADMISSION NO. 822:

The June 25, 1985 letter from Mr. Stejskal to Mr. Anderson was accompanied by an attachment.

RESPONSE TO REQUEST FOR ADMISSION NO. 822:

Deny that the letter identified in Response No. 821 refers to an attachment.

REQUEST FOR ADMISSION NO. 823:

The attachment to the June 25, 1985 letter from Mr. Stejskal to Mr. Anderson states "[t]he cause or exact place of the chemical spill in the San Bernardino Basin has been .isolated to an area north of 42nd Street and Magnolia, Avenue and southeast of the San Bernardino State University."

RESPONSE TO REQUEST FOR ADMISSION NO. 823:

Objection: see Response to Request. No. 822. Notwithstanding that objection, responding party admits that a document containing the same language quoted by propounding party in Request No. 823 appears in a document accompanying a June 1985 Official Notice of Public Hearing on a proposal to install organic removal facilities at the Newmark Reservoir and Pumping Station.

REQUEST FOR ADMISSION NO. 824:

The attachment to the June 25, 1985 letter from Mr. Stejskal to Mr. Anderson states "it is speculated that the spill may have occurred 10 to 15 years ago, and could have taken place over a period of years."

RESPONSE TO REQUEST FOR ADMISSION NO. 824:

Object: see Responses to Requ s No. 823 and 824. Notwithstan: ıg that objection, responding party admits that the language quoted in this request by propounding party appears in

the document accompanying a June 1985 Official Notice of Public Hearing on a proposal to install organic removal facilities at the Newmark Reservoir and Pumping Station.

REQUEST FOR ADMISSION NO. 825:

In February 1982 Joe Bocanegra of the City of San Bernardino inquired of the State of California whether Koppers Bitumastic Super Tank Solution would be acceptable to SEB.

RESPONSE TO REQUEST FOR ADMISSION NO. 825:

Despite diligent search and reasonable inquiry, responding party lacks sufficient information to respond and, on that basis, must deny the request.

REQUEST FOR ADMISSION NO. 826:

In February or March 1982, the City of San Bernardino ordered about 820 gallons of the solution to coat three new steel reservoirs currently under construction.

RESPONSE TO REQUEST FOR ADMISSION NO. 826:

Objection. The term "the solution" is not defined and the request is consequently vague and ambiguous. Notwithstanding that objection and assuming that propounding party is referencing Koppers Bitumastic Super Tank Solution, deny.

REQUEST OR ADMISSION NO. 827:

The City used the Koppers Bitumastic Super Tank Solution ordered in February or March, 1982 to coat the internal surface [sic] water tanks or reservoirs.

RESPONSE TO REQUEST FOR ADMISSION NO. 827:

Admit that the referenced Koppers Super Tank was used to coat certain interior surfaces of a reservoir.

REQUEST FOR ADMISSION NO. 828:

A report of a Sample for Chemical Analysis from the City of San Bernardino dated 6-14-83 was submitted to the State of California.

RESPONSE TO REQUEST FOR ADMISSION NO. 828:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with

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a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 829:

The Sample for Chemical Analysis report dated 6-14-83 reported a concentration of 30 micrograms per liter perchloroethylene for the City of San Bernardino Mountain tank.

RESPONSE TO REQUEST FOR ADMISSION NO. 829:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 830:

A Sample for Chemical Analysis from the City of San Bernardino dated 11-24-82 was submitted to the State of California.

RESPONSE TO REQUEST FOR ADMISSION NO. 830:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 831:

The Sample for Chemical Analysis report dated 11-24-82 reported a concentration of 8.8 micrograms per liter perchloroethylene for the City of San Bernardino Mountain tank.

RESPONSE TO REQUEST FOR ADMISSION NO. 831:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with

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a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 832:

A Sample for Chemical Analysis from the City of San Bernardino dated 11-17-82 was reported to the State of California.

RESPONSE TO REQUEST FOR ADMISSION NO. 832:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 833:

The Sample for Chemical Analysis report dated 11-17-82 reported a concentration of 46 micrograms per liter perchloroethylene for the City of San Bernardino Mountain tank.

RESPONSE TO REQUEST FOR ADMISSION NO. 833:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 834:

A report of a Sample for Chemical Analysis from the City of San Bernardino dated 12-29-82 for Mountain Tank 15' was submitted to the State of California.

RESPONSE TO REQUEST FOR ADMISSION NO. 834:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with

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a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 835:

The Sample for Chemical Analysis report dated 12-29-82 reported a concentration of 27.8 micrograms per liter perchloroethylene for the City of San Bernardino Mountain tank 15'.

RESPONSE TO REQUEST FOR ADMISSION NO. 835:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 836:

A Sample for Chemical Analysis from the City of San Bernardino dated 12-19-82 for Mountain Tank 22' was submitted to the State of California.

RESPONSE TO REQUEST FOR ADMISSION NO. 836:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 837:

The Sample for Chemical Analysis report dated 6-14-83 reported a concentration of 21.6 micrograms per liter perchloroethylene, for the City of San Bernardino Mountain Tank 22'.

RESPONSE TO REQUEST FOR ADMISSION NO. 837:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with

a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 838:

A report of a Sample for Chemical Analysis from the City of San Bernardino dated 12-29-82 for Mountain Tank 8.5' was submitted to the State of California.

RESPONSE TO REQUEST FOR ADMISSION NO. 838:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 839:

The Sample for Chemical Analysis report dated 12-29-82 reported a concentration of 23.0 micrograms per liter perchloroethylene for the City of San Bernardino Mountain Tank 8.5'.

RESPONSE TO REQUEST FOR ADMISSION NO. 839:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 840:

A report of a Sample for Chemical Analysis from the City of San Bernardino dated 12-29-82 for Mountain Tank 12' was submitted to the State of California.

RESPONSE TO REQUEST FOR ADMISSION NO. 840:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with

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a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 841:

The Sample for Chemical Analysis report dated 12-29-82 reported a concentration of 25.3 micrograms per liter perchloroethylene for the City of San Bernardino Mountain Tank 12'.

RESPONSE TO REQUEST FOR ADMISSION NO. 841:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 842:

A Sample for Chemical Analysis from the City of San Bernardino dated 12-29-82 for the Mountain Tank was submitted to the State of California.

RESPONSE TO REQUEST FOR ADMISSION NO. 842:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 843:

The Sample for Chemical Analysis report dated 12-29-82 reported a concentration of 28.9 micrograms per liter perchloroethylene for the City of San Bernardino Mountain Tank.

RESPONSE TO REQUEST FOR ADMISSION NO. 843:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with

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a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 844:

A Sample for Chemical Analysis from the City of San Bernardino dated 12-29-82 for Mountain Tank 15' was submitted to the State of California.

RESPONSE TO REQUEST FOR ADMISSION NO. 844:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 845:

The Sample for Chemical Analysis report dated 12-29-82 reported a concentration of 28.0 micrograms per liter perchloroethylene for the City of San Bernardino Mountain Thank 15'.

RESPONSE TO REQUEST FOR ADMISSION NO. 845:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 846:

A report of a Sample for Chemical Analysis from the City of San Bernardino dated 12-9-82 for Mountain Tank 14 ft was submitted to the-State of California.

RESPONSE TO REQUEST FOR ADMISSION NO. 846:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with

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a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 847:

The Sample for Chemical Analysis report dated 12-9-82 reported a concentration of 39 micrograms per liter perchloroethylene for the City of San Bernardino Mountain Tank 24'.

RESPONSE TO REQUEST FOR ADMISSION NO. 847:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 848:

A Sample for Chemical Analysis from the City of San Bernardino dated 12-9-82 for Mountain Tank 11 ft was submitted to the State of California.

RESPONSE TO REQUEST FOR ADMISSION NO. 848:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 849:

The Sample for Chemical Analysis report dated 12-9-82 reported a concentration of 41 micrograms per liter perchloroethylene, for the City of San Bernardino Mountain Tank 11'.

RESPONSE TO REQUEST FOR ADMISSION NO. 849:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with

a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 850:

A Sample for Chemical Analysis from the City of San Bernardino dated 12-9-82 for Mountain Tank 13.5 ft was submitted to the State of California.

RESPONSE TO REQUEST FOR ADMISSION NO. 850:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 851:

The Sample for Chemical Analysis report dated 12-9-82 reported a concentration of 32 micrograms per liter perchloroethylene for the City of San Bernardino Mountain Tank 13.5'.

RESPONSE TO REQUEST FOR ADMISSION NO. 851:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 852:

A Sample for Chemical Analysis from the City of San Bernardino dated 12-9-82 for Mountain Tank 8 ft was submitted to the State of California.

RESPONSE TO REQUEST FOR ADMISSION NO. 852:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with

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a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 853:

The Sample for Chemical Analysis report dated 12-9-82 reported a concentration of 49 micrograms per liter perchloroethylene for the City of San Bernardino Mountain Tank 8'.

RESPONSE TO REQUEST FOR ADMISSION NO. 853:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 854:

A report of Sample of Chemical Analysis from the City of San Bernardino dated 10-19-82 for Del Rosa No. 3 water tank was submitted to the State of California.

RESPONSE TO REQUEST FOR ADMISSION NO. 854:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 855:

The Sample for Chemical Analysis report dated 10-19-82 reported a concentration of 8.9 ppb PCE for Del Rosa No. 3 water tank.

RESPONSE TO REQUEST FOR ADMISSION NO. 855:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with

a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 856:

A report of Sample of Chemical Analysis from the City of San Bernardino dated 11-17-82 for Del Rosa Reservoir was submitted to the State of California.

RESPONSE TO REQUEST FOR ADMISSION NO. 856:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 857:

The Sample for Chemical Analysis report dated 11-17-82 reported a concentration of 9.7 micrograms per liter PCE for Del Rosa No. 3 Reservoir.

RESPONSE TO REQUEST FOR ADMISSION NO. 857:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 858:

A report of Sample of Chemical Analysis from the City of San Bernardino dated 7-29-82 for Del Rosa water tank was submitted to the State of California.

RESPONSE TO REQUEST FOR ADMISSION NO. 858:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with

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REQUEST FOR ADMISSION NO. 859:

The Sample for Chemical Analysis report dated 7-29-82 reported a concentration of 16 micrograms per liter PCE for Del Rosa water tank.

RESPONSE TO REQUEST FOR ADMISSION NO. 859:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 860:

A report of Sample of Chemical Analysis from the City of San Bernardino dated 8-6-82 for 3 M.G. water tank was submitted to the State of California.

RESPONSE TO REQUEST FOR ADMISSION NO. 860:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 861:

The Sample for Chemical Analysis report dated 8-6-82 reported a concentration of 16 ppb PCE for Del Rosa No. 3 water tank.

RESPONSE TO REQUEST FOR ADMISSION NO. 861:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with

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REQUEST FOR ADMISSION NO. 862:

The Sample for Chemical Analysis report dated 8-6-82 reported that the sample was "taken before tank drained."

RESPONSE TO REQUEST FOR ADMISSION NO. 862:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 863:

A report of Sample of Chemical Analysis from the City of San Bernardino dated 7-29-82 for Mountain Reservoir was submitted to the State of California.

RESPONSE TO REQUEST FOR ADMISSION NO. 863:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 864:

The Sample for Chemical Analysis report dated 7-29-82 reported a concentration of 197 micrograms per liter PCE for Mountain Reservoir.

RESPONSE TO REQUEST FOR ADMISSION NO. 864:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with

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a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 865:

A report of Sample of Chemical Analysis from the City of San Bernardino dated 8-6-82 for Mountain Tank was submitted to the State of California.

RESPONSE TO REQUEST FOR ADMISSION NO. 865:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 866:

The Sample for Chemical Analysis report dated 8-6-82 reported a concentration of 171 micrograms per liter PCE for Mountain Tank.

RESPONSE TO REQUEST FOR ADMISSION NO. 866:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 867:

The Sample for Chemical Analysis report dated 8-6-82 for the Mountain Tank reported that the sample was "taken before reservoir drained."

RESPONSE TO REQUEST FOR ADMISSION NO. 867:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with

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REQUEST FOR ADMISSION NO. 868:

A report of Sample of Chemical Analysis from the City of San Bernardino dated 8-16-82 for Mountain Reservoir was submitted to the State of California.

RESPONSE TO REQUEST FOR ADMISSION NO. 868:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 869:

The Sample for Chemical Analysis report dated 8-16-82 reported a concentration of 56 micrograms per liter PCE for Mountain Reservoir.

RESPONSE TO REQUEST FOR ADMISSION NO. 869:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 870:

A report of Sample of Chemical Analysis from the City of San Bernardino dated 8-31-82 for Mountain Reservoir was submitted to the State of California.

RESPONSE TO REQUEST FOR ADMISSION NO. 870:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with

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a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 871:

The Sample for Chemical Analysis report dated 8-31-82 reported a concentration of 235 micrograms per liter PCE for Mountain Reservoir.

RESPONSE TO REQUEST FOR ADMISSION NO. 871:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 872:

A report of Sample of Chemical Analysis from the City of San Bernardino dated 9-3-82 for Mountain Reservoir was submitted to the State of California.

RESPONSE TO REQUEST FOR ADMISSION NO. 872:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 873:

The Sample for Chemical Analysis report dated 9-3-82 reported a concentration of 410 micrograms per liter PCE for Mountain Reservoir.

RESPONSE TO REQUEST FOR ADMISSION NO. 873:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with

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a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 874:

A report of Sample of Chemical Analysis from-the City of San Bernardino dated 9-10-82 for Mountain Reservoir was submitted to the State of California.

RESPONSE TO REQUEST FOR ADMISSION NO. 874:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 875:

The Sample for Chemical Analysis report dated 9-10-82 reported a concentration of 810 micrograms per liter PCE for Mountain Reservoir.

RESPONSE TO REQUEST FOR ADMISSION NO. 875:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 876:

A report of Sample of Chemical Analysis from the City of San Bernardino dated 9-10-82 for Mountain Reservoir was submitted to the State of California.

RESPONSE TO REQUEST FOR ADMISSION NO. 876:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with

a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 877:

The Sample for Chemical Analysis report dated 9-10-82 reported a concentration of 682 micrograms per liter PCE for Mountain Reservoir.

RESPONSE TO REQUEST FOR ADMISSION NO. 877:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 878:

The Cajon County Landfill has affected the groundwater beneath the landfill.

RESPONSE TO REQUEST FOR ADMISSION NO. 878:

Objection. The term "affected" is so vague and ambiguous as to make response meaningless because it is unclear whether the term "affected" relates to the impact of the landfill on groundwater quantity, quality, flow rate, direction of flow, or some other parameter.

REQUEST FOR ADMISSION NO. 879:

The City has investigated whether the Cajon County Landfill caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 879:

Deny.

REQUEST FOR ADMISSION NO. 880:

The City has investigated whether the Cajon County Landfill contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 880:

Deny.

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REQUEST FOR ADMISSION NO. 881:

The Cajon County Landfill caused the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 881:

Deny.

REQUEST FOR ADMISSION NO. 882:

The Cajon County Landfill contributed to the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 882:

Deny.

REQUEST FOR ADMISSION NO. 883:

The County of San Bernardino is a PRP for the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 883:

Deny that the City considers the County of San Bernardino to be a PRP for the Newmark-Muscoy groundwater contamination at this time.

REQUEST FOR ADMISSION NO. 884:

The City possesses evidence that pipes in the City of San Bernardino's storm sewer system have leaked between the years of 1930 to the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 884:

Objection: the City of San Bernardino has a storm drain system, not a storm sewer system. Notwithstanding that objection , responding party admits that between 1930 and the present, water from the City's storm drain system has been released from the storm drain system to surface soil.

REQUEST FOR ADMISSION NO. 885:

The City possesses evidence that pipes in the City of San Bernardino's sanitary sewer system have leaked between the years of 1930 to the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 885:

Admit.

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REQUEST FOR ADMISSION NO. 886:

The City possesses evidence that pipes in the City of San Bernardino's water delivery system have leaked between the years of 1930 to the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 886:

Admit.

REQUEST FOR ADMISSION NO. 887:

The City possesses evidence that the Cajon County Landfill contributed to the groundwater contamination at the Newmark-Muscoy Superfund Site.

RESPONSE TO REQUEST FOR ADMISSION NO. 887:

Deny.

REQUEST FOR ADMISSION NO. 888:

The City possesses evidence that the Cajon County Landfill caused the groundwater contamination at the Newmark-Muscoy Superfund Site.

RESPONSE TO REQUEST FOR ADMISSION NO. 888:

Deny.

REQUEST FOR ADMISSION NO. 889:

The City possesses evidence that municipal sewage contains or contained hazardous substances between 1930 to the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 889:

Object because the Request is vague as to whether the City is asked to address municipal sewage generally or municipal sewage from the City. Notwithstanding that objection and assuming the request asks about the City's municipal sludge, deny as to contaminants of concern at this Site.

REQUEST FOR ADMISSION NO. 890:

The City possesses evidence that septic waste contains or contained hazardous substances between 1930 to the present.

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RESPONSE TO REQUEST FOR ADMISSION NO. 890:

Object because the Request is vague as to whether the City is asked to address septic waste generally or septic waste from the City. Notwithstanding that objection and assuming the request refers to septic waste disposed in the City's wastewater treatment system, deny.

REQUEST FOR ADMISSION NO. 891:

The City possesses evidence that aerosol paint concentrates have been released into the San Bernardino municipal sewer system between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 891:

Objection. The term "aerosol paint concentrates" is vague and undefined. Subject to that objection responding party admits that certain wastewater discharge permits for the San Bernardino municipal sewer system were issued that authorized the release of paint and/or paint solids.

REQUEST FOR ADMISSION NO. 892:

The City possesses evidence that agricultural chemicals have been released into the San Bernardino municipal sewer system between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 892:

Object because the request is unduly vague; the term "agricultural chemicals" is undefined and unreasonably broad. Notwithstanding that objection, deny.

REQUEST FOR ADMISSION NO. 893:

The City possesses evidence that automobile body polish and cleaners have been released into the San Bernardino municipal sewer system between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 893:

Deny.

REQUEST FOR ADMISSION NO. 894:

The City possesses evidence that furniture polish and cleaners have been released into the San Bernardino municipal sewer system between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 894:

Deny.

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REQUEST FOR ADMISSION NO. 895:

The City possesses evidence that household hard surface cleaners have been released into the San Bernardino municipal sewer system between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 895:

Objection. The term "household hard surface cleaners" is vague and undefined. Without a more specific definition, responding party is unable to admit or deny whether it has evidence of the release of such substances into its municipal sewer system.

REQUEST FOR ADMISSION NO. 896:

The City possesses evidence that household rug and upholstery cleaners have been released into the San Bernardino municipal sewer system between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 896:

Deny.

REQUEST FOR ADMISSION NO. 897:

The City possesses evidence that insecticides for crawling insects have been released into the San Bernardino municipal sewer system between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 897:

Admit that City employees have used insecticides in connection with maintenance and/or repair activities of the municipal sewer system.

REQUEST FOR ADMISSION NO. 898:

The City possesses evidence that insecticides for flying insects have been released into the San Bernardino municipal sewer system between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 898:

Admit that City employees have used insecticides in connection with maintenance and/or repair activities of the municipal sewer system.

REQUEST FOR ADMISSION NO. 899:

The City possesses evidence that laundry starch preparations have been released into the San Bernardino municipal sewer system between 1930 and the present.

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RESPONSE TO REQUEST FOR ADMISSION NO. 899:

Deny.

REQUEST FOR ADMISSION NO. 900:

The City possesses evidence that leather dressings and finishes have been released into the San Bernardino municipal sewer system between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 900:

Objection. The term "leather dressings and finishes" is vague and undefined. Without a more specific definition, responding party is unable to admit or deny whether such materials have been released into its municipal sewer system.

REQUEST FOR ADMISSION NO. 901:

The City possesses evidence that lubricating greases have been released into the San Bernardino municipal sewer system between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 901:

Admit that certain wastewater discharge permits for the San Bernardino municipal sewer system were issued that authorized the release of limited amounts of oil and grease into its municipal sewer system.

REQUEST FOR ADMISSION NO. 902:

The City possesses evidence that lubricating oils have, been released into the San Bernardino municipal sewer system between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 902:

Admit that certain wastewater discharge permits for the San Bernardino municipal sewer system were issued that authorized the release of limited amounts of oil and grease into its municipal sewer system.

REQUEST FOR ADMISSION NO. 903:

The City possesses evidence that nonstructural caulking compounds and sealants have been released into the San Bernardino municipal sewer system between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 903:

Deny.

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REQUEST FOR ADMISSION NO. 904:

The City possesses evidence that water and tempura [sic] colors (paint) have been released into the San Bernardino municipal sewer system between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 904:

Deny.

REQUEST FOR ADMISSION NO. 905:

The City possesses evidence that laundry and dry-cleaning pretreatment products have been released into the San Bernardino municipal sewer system between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 905:

Object. The terms "laundry and dry-cleaning pretreatment products" are vague and undefined. Notwithstanding that objection deny.

REQUEST FOR ADMISSION NO. 906:

The City possesses evidence that dry cleaning solvents have been released into the San Bernardino municipal sewer system between 1930 and the present:

RESPONSE TO REQUEST FOR ADMISSION NO. 906:

Admit.

REQUEST FOR ADMISSION NO. 907:

The City possesses evidence that oven cleaners have been released into the San Bernardino municipal sewer system between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 907:

Deny.

REQUEST FOR ADMISSION NO. 908:

The City possesses evidence that paint and varnish removers have been released into the San Bernardino municipal sewer system between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 908:

Object because the terms "paint and varnish removers" is vague and undefined. Notwithstanding that objection responding party admits that it possesses evidence that a

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wastewater discharge permit was issued which allowed release of a limited quantity of "paint thinner" into its municipal sewer system.

REQUEST FOR ADMISSION NO. 909:

The City possesses evidence that synthetic resins have been released into the San Bernardino municipal sewer system between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 909:

Object because the term "synthetic resins is unduly vague and undefined. Notwithstanding that objection, responding party admits that it possesses evidence that a wastewater discharge permit was issued which allowed release of a limited quantity of "synthetic resin" into its municipal sewer system.

REQUEST FOR ADMISSION NO. 910:

The City possesses evidence that rubber adhesives have been released into the San Bernardino municipal sewer system between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 910:

Deny.

REQUEST FOR ADMISSION NO. 911:

The City possesses evidence that textile finishes have been released into the San Bernardino municipal sewer system between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 911:

Object because the term "textile finishes" is vague and undefined. Notwithstanding that objection, deny.

REQUEST FOR ADMISSION NO. 912:

The City possesses evidence that waterproofing compounds have been released into the San Bernardino municipal sewer system between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 912:

Object because the term "waterproofing compounds is vague and undefined. Notwithstanding to that objection, deny.

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REQUEST FOR ADMISSION NO. 913:

The City possesses evidence that dry cleaning solvents have been released into the San Bernardino municipal sewer system between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 913:

See Response to request no. 905, above.

REQUEST FOR ADMISSION NO. 914:

The City possesses evidence that paint thinners have been released into the San Bernardino municipal sewer system between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 914:

Object because the term "paint thinners" is vague and undefined. Notwithstanding that objection, see Response to request number 908, above.

REQUEST FOR ADMISSION NO. 915:

The City possesses evidence that paint removers have been released into the San Bernardino municipal sewer system between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 915:

Object because the term "paint removers" is vague and undefined. Notwithstanding that objection, see Response to request number 908, above.

REQUEST FOR ADMISSION NO. 916:

The City possesses evidence that aerosol paint concentrates were disposed of in the Cajon County Landfill during the time period the landfill was open.

RESPONSE TO REQUEST FOR ADMISSION NO. 916:

Object because the term "aerosol paint concentrates" is vague and undefined. Notwithstanding that objection, deny.

REQUEST FOR ADMISSION NO. 917:

The City possesses evidence that agricultural chemicals were disposed of in the Cajon County Landfill during the time period the landfill was open.

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RESPONSE TO REQUEST FOR ADMISSION NO. 917:

Object because the term "agricultural chemicals" is vague and undefined. Notwithstanding that objection, deny.

REQUEST FOR ADMISSION NO. 918:

The City possesses evidence that automobile body polish and cleaners were disposed of in the Cajon County Landfill during the time period the landfill was open.

RESPONSE TO REQUEST FOR ADMISSION NO. 918:

Deny.

REQUEST FOR ADMISSION NO. 919:

The City possesses evidence that furniture polish and cleaners were disposed of in the Cajon County Landfill during the time period the landfill was open.

RESPONSE TO REQUEST FOR ADMISSION NO. 919:

Deny.

REQUEST FOR ADMISSION NO. 920:

The City possesses evidence that household hard surface cleaners were disposed of in the Cajon County Landfill during the time period the landfill was open.

RESPONSE TO REQUEST FOR ADMISSION NO. 920:

Objection. The term "household hard surface cleaners" is vague and undefined. Notwithstanding that objection, responding party denies that it has evidence of the disposal of materials that might be classified as "household hard surface cleaners" in the Cajon County Landfill.

REQUEST FOR ADMISSION NO. 921:

The City possesses evidence that household rug and upholstery cleaners were disposed of in the Cajon County Landfill during the time period the landfill was open.

RESPONSE TO REQUEST FOR ADMISSION NO. 921:

Deny.

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REQUEST FOR ADMISSION NO. 922:

The City possesses evidence that insecticides for crawling insects were disposed of in the Cajon County Landfill during the time period the landfill was open.

RESPONSE TO REQUEST FOR ADMISSION NO. 922:

Deny.

REQUEST FOR ADMISSION NO. 923:

The City possesses evidence that insecticides for flying insects were disposed of in the Cajon County Landfill during the time period the landfill was open.

RESPONSE TO REQUEST FOR ADMISSION NO. 923:

Deny.

REQUEST FOR ADMISSION NO. 924:

The City possesses evidence that laundry starch preparations were disposed of in the Cajon County Landfill during the time period the landfill was open.

RESPONSE TO REQUEST FOR ADMISSION NO. 924:

Deny.

REQUEST FOR ADMISSION NO. 925:

The City possesses evidence that leather dressings and finishes were disposed of in the Cajon County Landfill during the time period the landfill was open.

RESPONSE TO REQUEST FOR ADMISSION NO. 925:

Object because the term "leather dressings and finishes is vague and undefined. Notwithstanding that objection responding party denies that it possesses evidence that materials used as "leather dressings and finishes" were disposed in the Cajon County Landfill.

REQUEST FOR ADMISSION NO. 926:

The City possesses evidence that lubricating greases were disposed of in the Cajon County Landfill during the time period the landfill was open.

RESPONSE TO REQUEST FOR ADMISSION NO. 926:

Deny.

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REQUEST FOR ADMISSION NO. 927:

The City possesses evidence that lubricating oils were disposed of in the Cajon County Landfill during the time period the landfill was open.

RESPONSE TO REQUEST FOR ADMISSION NO. 927:

Deny.

REQUEST FOR ADMISSION NO. 928:

The City possesses evidence that nonstructural caulking compounds and sealants were disposed of in the Cajon County Landfill during the time period the landfill was open.

RESPONSE TO REQUEST FOR ADMISSION NO. 928:

Deny.

REQUEST FOR ADMISSION NO. 929:

The City possesses evidence that water- and- tempura [sic] colors (paint) were disposed of in the Cajon County Landfill during the time period the landfill was open.

RESPONSE TO REQUEST FOR ADMISSION NO. 929:

Deny.

REQUEST FOR ADMISSION NO. 930:

The City possesses evidence that laundry and dry-cleaning pretreatment products were disposed of in the Cajon County Landfill during the time period the landfill was open.

RESPONSE TO REQUEST FOR ADMISSION NO. 930:

Object because the term "laundry and dry-cleaning pretreatment products" is vague and undefined. Notwithstanding that objection, responding party denies that it possesses evidence that materials used for laundry and dry-cleaning pretreatment were disposed in the Cajon County Landfill.

REQUEST FOR ADMISSION NO. 931:

The City possesses evidence that dry cleaning solvents were disposed of in the Cajon County Landfill during the time period the landfill was open.

RESPONSE TO REQUEST FOR ADMISSION NO. 931:

Deny.

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REQUEST FOR ADMISSION NO. 932:

The City possesses evidence that oven cleaners were disposed of in the Cajon County Landfill during the time period the landfill was open.

RESPONSE TO REQUEST FOR ADMISSION NO. 932:

Deny.

REQUEST FOR ADMISSION NO. 933:

The City possesses evidence that paint and varnish removers were disposed of in the Cajon County Landfill during the time period the landfill was open.

RESPONSE TO REQUEST FOR ADMISSION NO. 933:

Object because the terms "paint and varnish removers" is vague and undefined. Notwithstanding that objection responding party denies that it possesses evidence that materials used as paint and varnish removers were disposed in the Cajon County Landfill.

REQUEST FOR ADMISSION NO. 934:

The City possesses evidence that synthetic resins were disposed of in the -Cajon County Landfill during the time period the landfill was open.

RESPONSE TO REQUEST FOR ADMISSION NO. 934:

Object because the term "synthetic resins" is vague and undefined. Notwithstanding that objection responding party denies that it possesses evidence that "synthetic resins" were disposed in the Cajon County Landfill.

REQUEST FOR ADMISSION NO. 935:

The City possesses evidence that rubber adhesives were disposed of in the Cajon County Landfill during the time period the landfill was open.

RESPONSE TO REQUEST FOR ADMISSION NO. 935:

Deny.

REQUEST FOR ADMISSION NO. 936:

The City possesses evidence that textile finishes were disposed of in the Cajon County Landfill during the time period the landfill was open.

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RESPONSE TO REQUEST FOR ADMISSION NO. 936:

Object because the term "textile finishes" is vague and undefined. Notwithstanding that objection responding party denies that it possesses evidence that materials used as "textile finishes" were disposed in the Cajon County Landfill.

REQUEST FOR ADMISSION NO. 937:

The City possesses evidence that waterproofing compounds were disposed of in the Cajon County Landfill during the time period the landfill was open.

RESPONSE TO REQUEST FOR ADMISSION NO. 937:

Object because the term "waterproofing compounds" is vague and undefined. Notwithstanding that objection responding party denies that it possesses evidence that materials used as "waterproofing compounds" were disposed in the Cajon County Landfill.

REQUEST FOR ADMISSION NO. 938:

The City possesses evidence that dry cleaning solvents were disposed of in the Cajon County Landfill during the time period the landfill was open.

RESPONSE TO REQUEST FOR ADMISSION NO. 938:

Deny.

REQUEST FOR ADMISSION NO. 939:

The City possesses evidence that dry cleaning solvents were disposed of in the Cajon County Landfill during the time period the landfill was open.

RESPONSE TO REQUEST FOR ADMISSION NO. 939:

See Response to request no. 938.

REQUEST FOR ADMISSION NO. 954:

The City possesses evidence that lubricating oils were disposed of in septic tanks in San Bernardino between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 954:

Deny.

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REQUEST FOR ADMISSION NO. 955:

The City possesses evidence that nonstructural caulking compounds and sealants were disposed of in septic tanks in San Bernardino between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 955:

Deny.

REQUEST FOR ADMISSION NO. 956:

The City possesses evidence that water and tempura [sic] colors (paint) were disposed of in septic tanks in San Bernardino between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 956:

Deny.

REQUEST FOR ADMISSION NO. 957:

The City possesses evidence that laundry and dry-cleaning pretreatment products were disposed of in septic tanks in San Bernardino between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 957:

Object because the terms "laundry and dry-cleaning pretreatment products" is vague and undefined. Notwithstanding that objection responding party denies that it possesses evidence that materials that could be used as "laundry and dry-cleaning pretreatment products" were disposed in septic tanks in San Bernardino.

REQUEST FOR ADMISSION NO. 958:

The City possesses evidence that dry cleaning solvents were disposed of in septic tanks in San Bernardino between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 958:

Deny.

REQUEST FOR ADMISSION NO. 959:

The City possesses evidence that oven cleaners were disposed of in septic tanks in San Bernardino between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 959:

Deny.

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REQUEST FOR ADMISSION NO. 960:

The City possesses evidence that paint and varnish removers were disposed of in septic tanks in San Bernardino between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 960:

Object because the terms "paint and varnish removers" is vague and undefined. Notwithstanding that objection responding party denies that it possesses evidence that materials that could be used as "paint and varnish removers" were disposed in septic tanks in San Bernardino.

REQUEST FOR ADMISSION NO. 961:

The City possesses evidence that synthetic resins were disposed of in septic tanks in San Bernardino between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 961:

Object because the term "synthetic resins" is vague and undefined. Notwithstanding that objection responding party denies that it possesses evidence "synthetic resins" were disposed in septic tanks in San Bernardino.

REQUEST FOR ADMISSION NO. 962:

The City possesses evidence that rubber adhesives were disposed of in septic tanks in San Bernardino between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 962:

Deny.

REQUEST FOR ADMISSION NO. 963:

The City possesses evidence that textile finishes were disposed of in septic tanks in San Bernardino between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 963:

Object because the term "textile finishes" is vague and undefined. Notwithstanding that objection responding party denies that it possesses evidence that materials that could be used as "textile finishes" were disposed in septic tanks in San Bernardino.

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REQUEST FOR ADMISSION NO. 964:

The City possesses evidence that waterproofing compounds were disposed of in septic tanks in San Bernardino between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 964:

Object because the term "waterproofing compounds" is vague and undefined. Notwithstanding that objection responding party denies that it possesses evidence that materials that could be used as "waterproofing compounds" were disposed in septic tanks in San Bernardino.

REQUEST FOR ADMISSION NO. 965:

The City possesses evidence that dry cleaning solvents were disposed of in septic tanks in San Bernardino between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 965:

See Response to request no. 958.

REQUEST FOR ADMISSION NO. 966:

The City possesses evidence that paint thinners were disposed of in septic tanks in San Bernardino between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 966:

Object because the term "paint thinners" is vague and undefined. Notwithstanding that objection responding party denies that it possesses evidence that materials used as "paint thinners" were disposed in septic tanks in San Bernardino.

REQUEST FOR ADMISSION NO. 967:

The City possesses evidence that paint removers were disposed of in septic tanks in San Bernardino between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 967:

Object because the term "paint removers" is vague and undefined. Notwithstanding that objection responding party denies that it possesses evidence that materials used as "paint thinners" were disposed in septic tanks in San Bernardino.

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REQUEST FOR ADMISSION NO. 968:

The City or its contractors used aerosol paint concentrates between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 968:

Object because the term "aerosol paint concentrates" is vague and undefined. Notwithstanding that objection, responding party admits that it or its contractors have used aerosol paint.

REQUEST FOR ADMISSION NO. 969:

The City or its contractors used agricultural chemicals between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 969:

Object because the term "agricultural chemicals" is vague and undefined. Notwithstanding that objection, responding party admits that it or its contractors have used substances such as pesticides that could be classified as "agricultural chemicals."

REQUEST FOR ADMISSION NO. 970:

The City or its contractors used automobile body polish and 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 970:

Admit.

REQUEST FOR ADMISSION NO. 971:

The City or its contractors used furniture polish between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 971:

Admit.

REQUEST FOR ADMISSION NO. 972:

City or its contractors used household hard surface cleaners between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 972:

Admit.

REQUEST FOR ADMISSION NO. 973:

The City or its contractors used rug and upholstery cleaners between 1930 and the present.

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RESPONSE TO REQUEST FOR ADMISSION NO. 973:

Admit.

REQUEST FOR ADMISSION NO. 974:

The City or its contractors used insecticides for crawling insects between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 974:

Admit.

REQUEST FOR ADMISSION NO. 975:

The City or its contractors used insecticides for flying insects between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 975:

Admit.

REQUEST FOR ADMISSION NO. 976:

The City or its contractors used laundry starch preparations between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 976:

Deny.

REQUEST FOR ADMISSION NO. 977:

The City or its contractors used leather dressings and finishes between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 977:

Object because the term "leather dressings and finishes is vague and undefined. Notwithstanding that objection responding party denies that it possesses evidence that it or its contractors used "leather dressings and finishes".

REQUEST FOR ADMISSION NO. 978:

The City or its contractors used lubricating greases between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 978:

Admit.

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REQUEST FOR ADMISSION NO. 979:

The City or its contractors used lubricating oils between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 979:

Admit.

REQUEST FOR ADMISSION NO. 980:

City or its contractors used nonstructural caulking compounds and sealants between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 980:

Admit.

REQUEST FOR ADMISSION NO. 981:

The City or its contractors used water and tempura [sic] colors (paint) between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 981:

Admit.

REQUEST FOR ADMISSION NO. 982:

The City or its contractors used laundry and dry-cleaning pretreatment products between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 982:

Object because the term "laundry and dry-cleaning products" is vague and undefined. Notwithstanding that objection, deny.

REQUEST FOR ADMISSION NO. 983:

The City or its contractors used dry cleaning solvents between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 983:

Deny.

REQUEST FOR ADMISSION NO. 984:

The City or its contractors used oven cleaners between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 984:

Admit.

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REQUEST FOR ADMISSION NO. 985:

The City or its contractors used varnish removers between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 985:

Object because the term "varnish removers" is vague and undefined. Notwithstanding that objection, responding party admits the use of materials that could be termed "varnish removers."

REQUEST FOR ADMISSION NO. 986:

The City or its contractors used synthetic resins between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 986:

Object because the term "synthetic resins" is vague and undefined. Notwithstanding that objection, responding party admits the use of materials that could be termed "synthetic resins."

REQUEST FOR ADMISSION NO. 987:

The City or its contractors used rubber adhesives between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 987:

Admit.

REQUEST FOR ADMISSION NO. 988:

The City or its contractors used textile finishes between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 988:

Object because the term "textile finishes" is vague and undefined. Notwithstanding that objection, deny.

REQUEST FOR ADMISSION NO. 989:

The City or its contractors used waterproofing compounds between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 989:

Object because the term "waterproofing compounds" is vague and undefined. Notwithstanding that objection, responding party admits the use of materials that could be termed "waterproofing compounds."

REQUEST FOR ADMISSION NO. 990:

The City or its contractors used dry cleaning chemicals between 1930 and the present.

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RESPONSE TO REQUEST FOR ADMISSION NO. 990:

Object because the term "dry cleaning chemicals" is vague and undefined. Notwithstanding that objection see Response to request no. 983, above.

REQUEST FOR ADMISSION NO. 991:

The City or its contractors used paint thinners between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 991:

Object because the term "paint thinners" is vague and undefined. Notwithstanding that objection, responding party admits the use of materials that could be termed "paint thinners."

REQUEST FOR ADMISSION NO. 992:

The City or its contractors used paint removers between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 992:

Object because the term "paint removers" is vague and undefined. Notwithstanding that objection responding party admits the use of materials that could be termed "paint removers."

REQUEST FOR ADMISSION NO. 993:

City or its contractors disposed of aerosol paint concentrates between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 993:

Responding party objects because the term "aerosol paint concentrates" is vague and undefined and because the term "disposed of" is vague and ambiguous. The City of San Bernardino has collected municipal waste generated by others for disposal, and thus if "aerosol paint concentrates" were contained in the material so collected, it could be said that the City "disposed of" such waste. The request can also be construed to ask whether "the City or its contractors disposed of their own "aerosol paint concentrates." Notwithstanding those objections, and assuming the latter interpretation of the request, despite diligent search and reasonable inquiry responding party lacks sufficient information to admit or deny the request.

REQUEST FOR ADMISSION NO. 994:

The City or its contractors disposed of agricultural chemicals between 1930 and the present.

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RESPONSE TO REQUEST FOR ADMISSION NO. 994:

Responding party objects because the term "agricultural chemicals" is vague and undefined and because the term "disposed of" is vague and ambiguous. The City of San Bernardino has collected municipal waste generated by others for disposal, and thus if "agricultural chemicals" were contained in the material so collected, it could be said that the City "disposed of" such waste. The request can also be construed to ask whether "the City or its contractors disposed of their own "agricultural chemicals." Notwithstanding those objections, and assuming the latter interpretation of the request, despite diligent search and reasonable inquiry responding party lacks sufficient information to admit or deny the request.

REQUEST FOR ADMISSION NO. 995:

The City or its contractors disposed of automobile body polish between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 995:

Responding party objects because the term "automobile body polish" is vague and undefined and because the term "disposed of" is vague and ambiguous. The City of San Bernardino has collected municipal waste generated by others for disposal, and thus if "automobile body polish" were contained in the material so collected, it could be said that the City "disposed of" such waste. The request can also be construed to ask whether "the City or its contractors disposed of their own "automobile body polish." Notwithstanding those objections, and assuming the latter interpretation of the request, despite diligent search and reasonable inquiry responding party lacks sufficient information to admit or deny the request.

REQUEST FOR ADMISSION NO. 996:

The City or its contractors disposed of furniture polish and between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 996:

Responding party because the term "disposed of" is vague and ambiguous. The City of San Bernardino has collected municipal waste generated by others for disposal, and thus if "furniture polish" were contained in the material so collected, it could be said that the City "disposed of" such waste. The request can also be construed to ask whether "the City or its

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contractors disposed of their own "furniture polish." Notwithstanding those objections, and assuming the latter interpretation of the request, despite diligent search and reasonable inquiry responding party lacks sufficient information to admit or deny the request.

REQUEST FOR ADMISSION NO. 997:

City or its contractors disposed of household hard surface cleaners between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 997:

Responding party objects because the term "disposed of" is vague and ambiguous: the City of San Bernardino has collected municipal waste generated by others for disposal, and thus if "household hard surface cleaners" were contained in the material so collected, it could be said that the City "disposed of" such waste. The request can also be construed to ask whether "the City or its contractors disposed of their own "household hard surface cleaners." Notwithstanding those objections, and assuming the latter interpretation of the request, despite diligent search and reasonable inquiry responding party lacks sufficient information to admit or deny the request.

REQUEST FOR ADMISSION NO. 998:

The City or its contractors disposed of rug and upholstery cleaners between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 998:

Responding party objects because the term "disposed of" is vague and ambiguous. The City of San Bernardino has collected municipal waste generated by others for disposal, and thus if "rug and upholstery cleaners" were contained in the material so collected, it could be said that the City "disposed of" such waste. The request can also be construed to ask whether "the City or its contractors disposed of their own "rug and upholstery cleaners." Notwithstanding those objections, and assuming the latter interpretation of the request, despite diligent search and reasonable inquiry responding party lacks sufficient information to admit or deny the request.

REQUEST FOR ADMISSION NO. 999:

The City or its contractors disposed of insecticides for crawling insects between 1930 and the present.

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RESPONSE TO REQUEST FOR ADMISSION NO. 999:

Responding party objects because the term "disposed of" is vague and ambiguous. The City of San Bernardino has collected municipal waste generated by others for disposal, and thus if "insecticides for crawling insects" were contained in the material so collected, it could be said that the City "disposed of" such waste. The request can also be construed to ask whether "the City or its contractors disposed of their own "insecticides for crawling insects." Notwithstanding those objections, and assuming the latter interpretation of the request, despite diligent search and reasonable inquiry responding party lacks sufficient information to admit or deny the request.

REQUEST FOR ADMISSION NO. 1000:

The City or its contractors disposed of insecticides for flying insects between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 1000:

Responding party objects because the term "disposed of" is vague and ambiguous. The City of San Bernardino has collected municipal waste generated by others for disposal, and thus if "insecticides for flying insects" were contained in the material so collected, it could be said that the City "disposed of" such waste. The request can also be construed to ask whether "the City or its contractors disposed of their own "insecticides for flying insects." Notwithstanding those objections, and assuming the latter interpretation of the request, despite diligent search and reasonable inquiry responding party lacks sufficient information to admit or deny the request.

REQUEST FOR ADMISSION NO. 1001:

The City or its contractors disposed of laundry starch preparations between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 1001:

Responding party objects because the term "disposed of" is vague and ambiguous. The City of San Bernardino has collected municipal waste generated by others for disposal, and thus if "laundry starch preparations" were contained in the material so collected, it could be said that the City "disposed of" such waste. The request can also be construed to ask whether "the City or its contractors disposed of their own "laundry starch preparations." Notwithstanding those

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objections, and assuming the latter interpretation of the request, despite diligent search and reasonable inquiry responding party lacks sufficient information to admit or deny the request.

REQUEST FOR ADMISSION NO. 1002:

The City or its contractors disposed of leather dressings and finishes between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 1002:

Responding party objects because the terms "leather dressings and finishes" is vague and undefined and because the term "disposed of" is vague and ambiguous. The City of San Bernardino has collected municipal waste generated by others for disposal, and thus if "leather dressings and finishes" were contained in the material so collected, it could be said that the City "disposed of" such waste. The request can also be construed to ask whether "the City or its contractors disposed of their own "leather dressing and finishes." Notwithstanding those objections, and assuming the latter interpretation of the request, despite diligent search and reasonable inquiry responding party lacks sufficient information to admit or deny the request.

REQUEST FOR ADMISSION NO. 1003:

The City or its contractors disposed of lubricating greases between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 1003:

Responding party objects because the term "disposed of" is vague and ambiguous. The City of San Bernardino has collected municipal waste generated by others for disposal, and thus if "lubricating greases" were contained in the material so collected, it could be said that the City "disposed of" such waste. The request can also be construed to ask whether "the City or its contractors disposed of their own "lubricating greases." Notwithstanding those objections, and assuming the latter interpretation of the request, despite diligent search and reasonable inquiry responding party lacks sufficient information to admit or deny the request.

REQUEST FOR ADMISSION NO. 1004:

The City or its contractors disposed of lubricating oils between 1930 and the present.

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RESPONSE TO REQUEST FOR ADMISSION NO. 1004:

Responding party objects because the term "disposed of" is vague and ambiguous. The City of San Bernardino has collected municipal waste generated by others for disposal, and thus if "lubricating oils" were contained in the material so collected, it could be said that the City "disposed of" such waste. The request can also be construed to ask whether "the City or its contractors disposed of their own "lubricating oils." Notwithstanding those objections, and assuming the latter interpretation of the request, admit.

REQUEST FOR ADMISSION NO. 1005:

The City or its contractors disposed of nonstructural caulking compounds and sealants between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 1005:

Responding party objects because the term "disposed of" is vague and ambiguous. The City of San Bernardino has collected municipal waste generated by others for disposal, and thus if "nonstructural caulking compounds" were contained in the material so collected, it could be said that the City "disposed of" such waste. The request can also be construed to ask whether "the City or its contractors disposed of their own "nonstructural caulking compounds." Notwithstanding those objections, and assuming the latter interpretation of the request, admit.

REQUEST FOR ADMISSION NO. 1006:

The City or its contractors disposed of water and tempura [sic] colors (paint) between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 1006:

Responding party objects because the term "disposed of" is vague and ambiguous. The City of San Bernardino has collected municipal waste generated by others for disposal, and thus if "water and tempera colors (paint)" were contained in the material so collected, it could be said that the City "disposed of" such waste. The request can also be construed to ask whether "the City or its contractors disposed of their own "water and tempera colors (paint)." Notwithstanding those objections, and assuming the latter interpretation of the request, despite

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diligent search and reasonable inquiry, responding party lacks sufficient information to admit or deny the request.

REQUEST FOR ADMISSION NO. 1007:

The City or its contractors disposed of laundry and dry-cleaning pretreatment products between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 1007:

Responding party objects because the term "laundry and dry-cleaning pretreatment products" is vague and undefined and because the term "disposed of" is vague and ambiguous. The City of San Bernardino has collected municipal waste generated by others for disposal, and thus if "laundry and dry-cleaning pre-treatment products" were contained in the material so collected, it could be said that the City "disposed of" such waste. The request can also be construed to ask whether "the City or its contractors disposed of their own "laundry and dry-cleaning pretreatment products." Notwithstanding those objections, and assuming the latter interpretation of the request, despite diligent search and reasonable inquiry, responding party lacks sufficient information to admit or deny the request.

REQUEST FOR ADMISSION NO. 1008:

The City or its contractors disposed of dry cleaning solvents between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 1008:

Responding party objects because the term "disposed of" is vague and ambiguous. The City of San Bernardino has collected municipal waste generated by others for disposal, and thus if "dry-cleaning solvents" were contained in the material so collected, it could be said that the City "disposed of" such waste. The request can also be construed to ask whether "the City or its contractors disposed of their own "dry-cleaning solvents." Notwithstanding those objections, and assuming the latter interpretation of the request, despite diligent search and reasonable inquiry, responding party lacks sufficient information to admit or deny the request.

REQUEST FOR ADMISSION NO. 1009:

The City or its contractors disposed of oven cleaners between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 1009:

Responding party objects because the term "disposed of" is vague and ambiguous. The City of San Bernardino has collected municipal waste generated by others for disposal, and thus if "oven cleaners" were contained in the material so collected, it could be said that the City "disposed of" such waste. The request can also be construed to ask whether "the City or its contractors disposed of their own "oven cleaners." Notwithstanding those objections, and assuming the latter interpretation of the request, despite diligent search and reasonable inquiry, responding party lacks sufficient information to admit or deny the request.

REQUEST FOR ADMISSION NO. 1010:

The City or its contractors disposed of varnish removers between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 1010:

Responding party objects because the term "varnish removers" is vague and undefined and because the term "disposed of" is vague and ambiguous. The City of San Bernardino has collected municipal waste generated by others for disposal, and thus if "varnish removers" were contained in the material so collected, it could be said that the City "disposed of" such waste. The request can also be construed to ask whether "the City or its contractors disposed of their own "varnish removers." Notwithstanding those objections, and assuming the latter interpretation of the request, despite diligent search and reasonable inquiry, responding party lacks sufficient information to admit or deny the request.

REQUEST FOR ADMISSION NO. 1011:

The City or its contractors disposed of synthetic resins between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 1011:

Responding party objects because the term "synthetic resins" is vague and undefined and because the term "disposed of" is vague and ambiguous. The City of San Bernardino has collected municipal waste generated by others for disposal, and thus if "synthetic resins" were contained in the material so collected, it could be said that the City "disposed of" such waste. The request can also be construed to ask whether "the City or its contractors disposed of their own "synthetic resins." Notwithstanding those objections, and assuming the latter interpretation

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of the request, despite diligent search and reasonable inquiry, responding party lacks sufficient information to admit or deny the request.

REQUEST FOR ADMISSION NO. 1012:

The City or its contractors disposed of rubber adhesives between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 1012:

Responding party objects because the term "disposed of" is vague and ambiguous. The City of San Bernardino has collected municipal waste generated by others for disposal, and thus if "rubber adhesives" were contained in the material so collected, it could be said that the City "disposed of" such waste. The request can also be construed to ask whether "the City or its contractors disposed of their own "rubber adhesives." Notwithstanding those objections, and assuming the latter interpretation of the request, despite diligent search and reasonable inquiry, responding party lacks sufficient information to admit or deny the request.

REQUEST FOR ADMISSION NO. 1013:

The City or its contractors disposed of textile finishes between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 1013:

Responding party objects because the term "textile finishes" is vague and undefined and because the term "disposed of" is vague and ambiguous. The City of San Bernardino has collected municipal waste generated by others for disposal, and thus if "textile finishes" were contained in the material so collected, it could be said that the City "disposed of" such waste. The request can also be construed to ask whether "the City or its contractors disposed of their own "textile finishes." Notwithstanding those objections, and assuming the latter interpretation of the request, despite diligent search and reasonable inquiry, responding party lacks sufficient information to admit or deny the request.

REQUEST FOR ADMISSION NO. 1014:

The City or its contractors disposed of waterproofing compounds between 1930 and the present.

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RESPONSE TO REQUEST FOR ADMISSION NO. 1014:

Responding party objects because the term "disposed of" is vague and ambiguous. The City of San Bernardino has collected municipal waste generated by others for disposal, and thus if "waterproofing compounds" were contained in the material so collected, it could be said that the City "disposed of" such waste. The request can also be construed to ask whether "the City or its contractors disposed of their own "waterproofing compounds." Notwithstanding those objections, and assuming the latter interpretation of the request, despite diligent search and reasonable inquiry, responding party lacks sufficient information to admit or deny the request.

REQUEST FOR ADMISSION NO. 1015:

The City or its contractors disposed of dry cleaning chemicals between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 1015:

Responding party objects because the term "dry cleaning chemicals" is vague and undefined" and because the term "disposed of" is vague and ambiguous. The City of San Bernardino has collected municipal waste generated by others for disposal, and thus if "dry cleaning chemicals" were contained in the material so collected, it could be said that the City "disposed of" such waste. The request can also be construed to ask whether "the City or its contractors disposed of their own "dry cleaning chemicals." Notwithstanding those objections, and assuming the latter interpretation of the request, despite diligent search and reasonable inquiry, responding party lacks sufficient information to admit or deny the request.

REQUEST FOR ADMISSION NO. 1016:

The City or its contractors disposed-of paint thinners between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 1016:

Responding party objects because the term "paint thinners" is vague and undefined and because the term "disposed of" is vague and ambiguous. The City of San Bernardino has collected municipal waste generated by others for disposal, and thus if "paint thinners" were contained in the material so collected, it could be said that the City "disposed of" such waste. The request can also be construed to ask whether "the City or its contractors disposed of their

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own "paint thinners." Notwithstanding those objections, and assuming the latter interpretation of the request, responding party admits to the disposal of materials used as "paint thinners."

REQUEST FOR ADMISSION NO. 1017:

The City or its contractors disposed of paint removers between 1930 and the present.

RESPONSE TO REQUEST FOR ADMISSION NO. 1017:

Responding party objects because the term "paint removers" is vague and undefined and because the term "disposed of" is vague and ambiguous. The City of San Bernardino has collected municipal waste generated by others for disposal, and thus if "paint removers" were contained in the material so collected, it could be said that the City "disposed of" such waste. The request can also be construed to ask whether "the City or its contractors disposed of their own "paint removers." Notwithstanding those objections, and assuming the latter interpretation of the request, responding party admits to the disposal of materials used as "paint removers."

REQUEST FOR ADMISSION NO. 1018:

Aerosol paint concentrates may contain PCE.

RESPONSE TO REQUEST FOR ADMISSION NO. 1018:

Object because the request is too vague and ambiguous to permit a direct response. It does not refer to any particular product, brand, manufacturer, formulation, or time period. In addition, asking if the referenced material "may" contain something renders a meaningful direct response impossible. The subject material "may" contain virtually anything. Deny for reasons stated.

REQUEST FOR ADMISSION NO. 1019:

Agricultural chemicals may contain PCE.

RESPONSE TO REQUEST FOR ADMISSION NO. 1019:

Object because the request is too vague and ambiguous to permit a direct response. It does not refer to any particular product, brand, manufacturer, formulation, or time period. In addition, asking if the referenced material "may" contain something renders a meaningful direct response impossible. The subject material "may" contain virtually anything. Deny for reasons stated.

REQUEST FOR ADMISSION NO. 1020:

Automobile body polish and cleaners may contain PCE.

RESPONSE TO REQUEST FOR ADMISSION NO. 1020:

Object because the request is too vague and ambiguous to permit a direct response. It does not refer to any particular product, brand, manufacturer, formulation, or time period. In addition, asking if the referenced material "may" contain something renders a meaningful direct response impossible. The subject material "may" contain virtually anything. Deny for reasons stated.

REQUEST FOR ADMISSION NO. 1021:

Furniture polish and cleaner may contain PCE.

RESPONSE TO REQUEST FOR ADMISSION NO. 1021:

Object because the request is too vague and ambiguous to permit a direct response. It does not refer to any particular product, brand, manufacturer, formulation, or time period. In addition, asking if the referenced material "may" contain something renders a meaningful direc response impossible. The subject material "may" contain virtually anything. Deny for reasons stated.

REQUEST FOR ADMISSION NO. 1022:

Household hard surface cleaners may contain PCE.

RESPONSE TO REQUEST FOR ADMISSION NO. 1022:

Object because the request is too vague and ambiguous to permit a direct response. It does not refer to any particular product, brand, manufacturer, formulation, or time period. In addition, asking if the referenced material "may" contain something renders a meaningful direct response impossible. The subject material "may" contain virtually anything. Deny for reasons stated.

REQUEST FOR ADMISSION NO. 1023:

Household rug and upholstery cleaners may contain PCE.

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RESPONSE TO REQUEST FOR ADMISSION NO. 1023:

Object because the request is too vague and ambiguous to permit a direct response. It does not refer to any particular product, brand, manufacturer, formulation, or time period. In addition, asking if the referenced material "may" contain something renders a meaningful direct response impossible. The subject material "may" contain virtually anything. Deny for reasons stated.

REQUEST FOR ADMISSION NO. 1024:

Insecticides for crawling insects may contain PCE.

RESPONSE TO REQUEST FOR ADMISSION NO. 1024:

Object because the request is too vague and ambiguous to permit a direct response. It does not refer to any particular product, brand, manufacturer, formulation, or time period. In addition, asking if the referenced material "may" contain something renders a meaningful direct response impossible. The subject material "may" contain virtually anything. Deny for reasons stated.

REQUEST FOR ADMISSION NO. 1025:

Insecticides for flying insects may contain PCE.

RESPONSE TO REQUEST FOR ADMISSION NO. 1025:

See General Objection B. Object because the request is too vague and ambiguous to permit a direct response. It does not refer to any particular product, brand, manufacturer, formulation, or time period. In addition, asking if the referenced material "may" contain something renders a meaningful direct response impossible. The subject material "may" contain virtually anything. Deny for reasons stated.

REQUEST FOR ADMISSION NO. 1026:

Laundry starch preparations may contain PCE.

RESPONSE TO REQUEST FOR ADMISSION NO. 1026:

Object because the request is too vague and ambiguous to permit a direct response. It does not refer to any particular product, brand, manufacturer, formulation, or time period. In addition, asking if the referenced material "may" contain something renders a meaningful direct

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response impossible. The subject material "may" contain virtually anything. Deny for reasons stated.

REQUEST FOR ADMISSION NO. 1027:

Leather dressings and finishes may contain PCE.

RESPONSE TO REQUEST FOR ADMISSION NO. 1027:

See General Objection B. Object because the request is too vague and ambiguous to permit a direct response. It does not refer to any particular product, brand, manufacturer, formulation, or time period. In addition, asking if the referenced material "may" contain something renders a meaningful direct response impossible. The subject material "may" contain virtually anything. Deny for reasons stated.

REQUEST FOR ADMISSION NO. 1028:

Lubricating greases may contain PCE.

RESPONSE TO REQUEST FOR ADMISSION NO. 1028:

Object because the request is too vague and ambiguous to permit a direct response. It does not refer to any particular product, brand, manufacturer, formulation, or time period. In addition, asking if the referenced material "may" contain something renders a meaningful direct response impossible. The subject material "may" contain virtually anything. Deny for reasons stated.

REQUEST FOR ADMISSION NO. 1029:

Lubricating oils may contain PCE.

RESPONSE TO REQUEST FOR ADMISSION NO. 1029:

Object because the request is too vague and ambiguous to permit a direct response. It does not refer to any particular product, brand, manufacturer, formulation, or time period. In addition, asking if the referenced material "may" contain something renders a meaningful direct response impossible. The subject material "may" contain virtually anything. Deny for reasons stated.

REQUEST FOR ADMISSION NO. 1030:

Nonstructural caulking compounds and sealants may contain PCE.

RESPONSE TO REQUEST FOR ADMISSION NO. 1030:

Object because the request is too vague and ambiguous to permit a direct response. It does not refer to any particular product, brand, manufacturer, formulation, or time period. In addition, asking if the referenced material "may" contain something renders a meaningful direct response impossible. The subject material "may" contain virtually anything. Deny for reasons stated.

REQUEST FOR ADMISSION NO. 1031:

Water and tempura [sic] paints may contain PCE.

RESPONSE TO REQUEST FOR ADMISSION NO. 1031:

Object because the request is too vague and ambiguous to permit a direct response. It does not refer to any particular product, brand, manufacturer, formulation, or time period. In addition, asking if the referenced material "may" contain something renders a meaningful direct response impossible. The subject material "may" contain virtually anything. Deny for reasons stated.

REQUEST FOR ADMISSION NO. 1032:

Ironing aids may contain PCE.

RESPONSE TO REQUEST FOR ADMISSION NO. 1032:

Object because the request is too vague and ambiguous to permit a direct response. It does not refer to any particular product, brand, manufacturer, formulation, or time period. In addition, asking if the referenced material "may" contain something renders a meaningful direct response impossible. The subject material "may" contain virtually anything. Deny for reasons stated.

REQUEST FOR ADMISSION NO. 1033:

Laundry and dry cleaning pretreatments may contain PCE.

RESPONSE TO REQUEST FOR ADMISSION NO. 1033:

See General Objection B. Object because the request is too vague and ambiguous to permit a direct response. It does not refer to any particular product, brand, manufacturer, formulation, or time period. In addition, asking if the referenced material "may" contain

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something renders a meaningful direct response impossible. The subject material "may" contai virtually anything. Deny for reasons stated.

REQUEST FOR ADMISSION NO. 1034:

Rubber floor and wall coverings may contain PCE.

RESPONSE TO REQUEST FOR ADMISSION NO. 1034:

See General Objection B. Object because the request is too vague and ambiguous to permit a direct response. It does not refer to any particular product, brand, manufacturer, formulation, or time period. In addition, asking if the referenced material "may" contain something renders a meaningful direct response impossible. The subject material "may" contain virtually anything. Deny for reasons stated.

REQUEST FOR ADMISSION NO. 1035:

Oven cleaners may contain PCE.

RESPONSE TO REQUEST FOR ADMISSION NO. 1035:

Object because the request is too vague and ambiguous to permit a direct response. It does not refer to any particular product, brand, manufacturer, formulation, or time period. In addition, asking if the referenced material "may" contain something renders a meaningful direct response impossible. The subject material "may" contain virtually anything. Deny for reasons stated.

REQUEST FOR ADMISSION NO. 1036:

Paint and varnish removers may contain PCE.

RESPONSE TO REQUEST FOR ADMISSION NO. 1036:

See General Objection B. Object because the request is too vague and ambiguous to permit a direct response. It does not refer to any particular product, brand, manufacturer, formulation, or time period. In addition, asking if the referenced material "may" contain something renders a meaningful direct response impossible. The subject material "may" contain virtually anything. Deny for reasons stated.

REQUEST FOR ADMISSION NO. 1037:

Paints may contain PCE.

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RESPONSE TO REQUEST FOR ADMISSION NO. 1037:

Object because the request is too vague and ambiguous to permit a direct response. It does not refer to any particular product, brand, manufacturer, formulation, or time period. In addition, asking if the referenced material "may" contain something renders a meaningful direct response impossible. The subject material "may" contain virtually anything. Deny for reasons stated.

REQUEST FOR ADMISSION NO. 1038:

Synthetic resin and rubber adhesives may contain PCE.

RESPONSE TO REQUEST FOR ADMISSION NO. 1038:

See General Objection B. Object because the request is compound, too vague and ambiguous to permit a direct response. It does not refer to any particular product, brand, manufacturer, formulation, or time period. In addition, asking if the referenced material "may" contain something renders a meaningful direct response impossible. The subject material "may" contain virtually anything. Deny for reasons stated.

REQUEST FOR ADMISSION NO. 1039:

Textile finishes may contain PCE.

RESPONSE TO REQUEST FOR ADMISSION NO. 1039:

See General Objection B. Object because the request is too vague and ambiguous to permit a direct response. It does not refer to any particular product, brand, manufacturer, formulation, or time period. In addition, asking if the referenced material "may" contain something renders a meaningful direct response impossible. The subject material "may" contain virtually anything. Deny for reasons stated.

REQUEST FOR ADMISSION NO. 1040:

Waterproofing compounds may contain PCE.

RESPONSE TO REQUEST FOR ADMISSION NO. 1040:

See General Objection B. Object because the request is too vague and ambiguous to permit a direct response. It does not refer to any particular product, brand, manufacturer, formulation, or time period. In addition, asking if the referenced material "may" contain

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something renders a meaningful direct response impossible. The subject material "may" contai virtually anything. Deny for reasons stated.

REQUEST FOR ADMISSION NO. 1041:

Aerosol paint concentrates may contain TCE.

RESPONSE TO REQUEST FOR ADMISSION NO. 1041:

Object because the request is too vague and ambiguous to permit a direct response. It does not refer to any particular product, brand, manufacturer, formulation, or time period. In addition, asking if the referenced material "may" contain something renders a meaningful direct response impossible. The subject material "may" contain virtually anything. Deny for reasons stated.

REQUEST FOR ADMISSION NO. 1042:

Sealants, may contain TCE.

RESPONSE TO REQUEST FOR ADMISSION NO. 1042:

Object because the request is too vague and ambiguous to permit a direct response. It does not refer to any particular product, brand, manufacturer, formulation, or time period. In addition, asking if the referenced material "may" contain something renders a meaningful direct response impossible. The subject material "may" contain virtually anything. Deny for reasons stated.

REQUEST FOR ADMISSION NO. 1043:

Lubricating oils may contain TCE.

RESPONSE TO REQUEST FOR ADMISSION NO. 1043:

Object because the request is too vague and ambiguous to permit a direct response. It does not refer to any particular product, brand, manufacturer, formulation, or time period. In addition, asking if the referenced material "may" contain something renders a meaningful direct response impossible. The subject material "may" contain virtually anything. Deny for reasons stated.

REQUEST FOR ADMISSION NO. 1044:

Laundry and ironing aids may contain TCE.

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RESPONSE TO REQUEST FOR ADMISSION NO. 1044:

See General Objection B. Object because the request is too vague and ambiguous to permit a direct response. It does not refer to any particular product, brand, manufacturer, formulation, or time period. In addition, asking if the referenced material "may" contain something renders a meaningful direct response impossible. The subject material "may" contain virtually anything. Deny for reasons stated.

REQUEST FOR ADMISSION NO. 1045:

Laundry and dry cleaning pretreatments may contain TCE.

RESPONSE TO REQUEST FOR ADMISSION NO. 1045:

See General Objection B. Object because the request is too vague and ambiguous to permit a direct response. It does not refer to any particular product, brand, manufacturer, formulation, or time period. In addition, asking if the referenced material "may" contain something renders a meaningful direct response impossible. The subject material "may" contain virtually anything. Deny for reasons stated.

REQUEST FOR ADMISSION NO. 1046:

Paint and varnish removers may contain TCE.

RESPONSE TO REQUEST FOR ADMISSION NO. 1046:

See General Objection B. Object because the request is too vague and ambiguous to permit a direct response. It does not refer to any particular product, brand, manufacturer, formulation, or time period. In addition, asking if the referenced material "may" contain something renders a meaningful direct response impossible. The subject material "may" contain virtually anything. Deny for reasons stated.

REQUEST FOR ADMISSION NO. 1047:

Synthetic resin and rubber adhesives may contain TCE.

RESPONSE TO REQUEST FOR ADMISSION NO. 1047:

See General Objection B. Object because the request is too vague and ambiguous to permit a direct response. It does not refer to any particular product, brand, manufacturer, formulation, or time period. In addition, asking if the referenced material "may" contain

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something renders a meaningful direct response impossible. The subject material "may" conta virtually anything. Deny for reasons stated.

REQUEST FOR ADMISSION NO. 1048:

If the City of San Bernardino released any TCE, PCE, freon, or carbon tetrachloride onto the ground above the Newmark-Muscoy groundwater contamination, then the City is a PRP.

RESPONSE TO REQUEST FOR ADMISSION NO. 1048:

Objection because the request is vague and misleading. The term "PRP," which is undefined by CERLA, is used in a variety of ways with a variety of connotations and legal implications, and propounding party provides no guidance as to the sense of the term "PRP" upon which this Request is based. Notwithstanding that objection, deny.

REQUEST FOR ADMISSION NO. 1049:

If the County of San Bernardino released any TCE, PCE, freon, or carbon tetrachloride onto the ground above the Newmark-Muscoy groundwater contamination, then the County is a PRP.

RESPONSE TO REQUEST FOR ADMISSION NO. 1049:

Objection because the request is vague and misleading. The term "PRP," which is undefined by CERLA, is used in a variety of ways with a variety of connotations and legal implications, and propounding party provides no guidance as to the sense of the term "PRP" upon which this Request is based. Notwithstanding that objection, and based upon current information, responding party denies that it considers the County of San Bernardino to be a PRP at this time.

REQUEST FOR ADMISSION NO. 1050:

If the State of California released any TCE, PCE, freon, or carbon tetrachloride onto the ground above the Newmark-Muscoy groundwater contamination, then the State is a PRP.

RESPONSE TO REQUEST FOR ADMISSION NO. 1050:

Objection because the request is vague and misleading. The term "PRP," which is undefined by CERLA, is used in a variety of ways with a variety of connotations and legal implications, and propounding party provides no guidance as to the sense of the term "PRP"

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upon which this Request is based. Notwithstanding that objection, and based upon current information, responding party denies that it considers the State of California to be a PRP at this time.

REQUEST FOR ADMISSION NO. 1051:

The County of San Bernardino is jointly and severally liable to the City of San Bernardino for response costs incurred by the City in connection with the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 1051:

Responding party denies that it considers the County of San Bernardino to be jointly and severally liable to the City at this time.

REQUEST FOR ADMISSION NO. 1052:

The County of San Bernardino is jointly and severally liable to the State of California for damages to the State of California caused by the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 1052:

Responding party denies that it considers the County of San Bernardino to be jointly and severally liable to the State of California at this time.

REQUEST FOR ADMISSION NO. 1053:

The City of San Bernardino is jointly and severally liable to the State of California for response costs incurred by the State in connection with the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 1053:

Deny.

REQUEST FOR ADMISSION NO. 1054:

The City of San Bernardino is jointly and severally liable to the State of California for damages to the State of California's natural resources caused by the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 1054:

Deny.

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REQUEST FOR ADMISSION NO. 1055:

The City of San Bernardino Municipal Water District installed two high volume "super wells" in the late 1980s.

RESPONSE TO REQUEST FOR ADMISSION NO. 1055:

Objection: there is no entity named the City of San Bernardino Municipal Water District, and consequently the request is meaningless. Assuming that propounding party intended to refer to Plaintiff, the City of San Bernardino Municipal Water Department, deny.

REQUEST FOR ADMISSION NO. 1056:

The City of San Bernardino Municipal Water District installed the two high volume "super wells" to lower the groundwater table.

RESPONSE TO REQUEST FOR ADMISSION NO. 1056:

Objection: there is no entity named the City of San Bernardino Municipal Water District, and consequently the request is meaningless. Assuming that propounding party intended to refer to Plaintiff, the City of San Bernardino Municipal Water Department, deny.

REQUEST FOR ADMISSION NO. 1057:

As a result of pumping from the two high volume "super wells," the City of San Bernardino Municipal Water District was able to lower the groundwater table.

RESPONSE TO REQUEST FOR ADMISSION NO. 1057:

Objection: there is no entity named the City of San Bernardino Municipal Water District, and consequently the request is meaningless. Assuming that propounding party intended to refer to Plaintiff, the City of San Bernardino Municipal Water Department, deny.

REQUEST FOR ADMISSION NO. 1058:

The City of San Bernardino Municipal Water District installed two high volume "super wells" without studying the environmental effects of the wells.

RESPONSE TO REQUEST FOR ADMISSION NO. 1058:

Objection: there is no entity named the City of San Bernardino Municipal Water District, and consequently the request is meaningless. Assuming that propounding party intended to refer to Plaintiff, the City of San Bernardino Municipal Water Department, deny.

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REQUEST FOR ADMISSION NO. 1059:

The City of San Bernardino Municipal Water District installed two high volume "super wells" without studying the effects that pumping from these wells would have on the contamination in the groundwater.

RESPONSE TO REQUEST FOR ADMISSION NO. 1059:

Objection: there is no entity named the City of San Bernardino Municipal Water District, and consequently the request is meaningless. Assuming that propounding party intended to refer to Plaintiff, the City of San Bernardino Municipal Water Department, deny.

REQUEST FOR ADMISSION NO. 1060:

The City of San Bernardino Municipal Water District sold water pumped from the two high volume "super wells."

RESPONSE TO REQUEST FOR ADMISSION NO. 1060:

Objection: there is no entity named the City of San Bernardino Municipal Water District, and consequently the request is meaningless. Assuming that propounding party intended to refer to Plaintiff, the City of San Bernardino Municipal Water Department, deny.

REQUEST FOR ADMISSION NO. 1061:

The City of San Bernardino Municipal Water Department earned a profit on water that was pumped from the two high volume "super wells" and then sold [sic].

RESPONSE TO REQUEST FOR ADMISSION NO. 1061:

Deny.

REQUEST FOR ADMISSION NO. 1062:

Pumping from the two high volume "super wells" accelerated the spread of contaminated groundwater beneath the surface of San Bernardino.

RESPONSE TO REQUEST FOR ADMISSION NO. 1062:

Deny.

REQUEST FOR ADMISSION NO. 1063:

Pumping from the two high volume "super wells" caused a release of contaminants into previously uncontaminated groundwater.

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RESPONSE TO REQUEST FOR ADMISSION NO. 1063:

Deny.

REQUEST FOR ADMISSION NO. 1064:

Pumping from the two high volume "super wells" contributed to a release of contaminants into previously uncontaminated groundwater.

RESPONSE TO REQUEST FOR ADMISSION NO. 1064:

Deny.

REQUEST FOR ADMISSION NO. 1065:

Between 1930 and the present the City of San Bernardino has stored confined potable water in distribution reservoirs or above ground steel and concrete storage tanks.

RESPONSE TO REQUEST FOR ADMISSION NO. 1065:

Admit.

REQUEST FOR ADMISSION NO. 1066:

The interior surfaces of these storage tanks (and their appurtenances) utilized by the City of San Bernardino for the storage of potable water were lined or coated.

RESPONSE TO REQUEST FOR ADMISSION NO. 1066:

Object because the request is vague and ambiguous. Notwithstanding that objection, responding party admits that some interior surfaces of some tanks used for the storage of potable water were coated.

REQUEST FOR ADMISSION NO. 1067:

The interior surfaces of at least some of the storage tanks utilized by the City of San Bernardino for the storage of potable water were lined with a Hypalon liner or coated with a cold-applied coal-tar-product.

RESPONSE TO REQUEST FOR ADMISSION NO. 1067:

Object because the request is vague and ambiguous. Notwithstanding that objection responding party admits that some interior surfaces of some storage tanks were coated with a cold-applied coal-tar product.

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REQUEST FOR ADMISSION NO. 1068:

By 1979, approximately 78% of the potable water storage tanks utilized within the State of California had been coated with a cold-applied coal-tar product.

RESPONSE TO REQUEST FOR ADMISSION NO. 1068:

Despite diligent search and reasonable inquiry, responding party lacks sufficient information to admit or deny the request.

REQUEST FOR ADMISSION NO. 1069:

The cold-applied coal-tar products were applied to the interior surface of potable water storage tanks by means of a spraying process.

RESPONSE TO REQUEST FOR ADMISSION NO. 1069:

Object because the request is vague and ambiguous. Notwithstanding that objection, responding party denies that cold-applied coal-tar products were applied to the interior surfaces of all potable water tanks by means of a spraying process.

REQUEST FOR ADMISSION NO. 1070:

Each of the following is a cold-applied coal-tar product (respond to each):

(a) Bitumastic Super Tank Solution (prior to 1983);

(b) Tnemac [sic] 46-465 Hi-Build Coal Tar Coating (prior to 1981); and

(c) Engard 800.

RESPONSE TO REQUEST FOR ADMISSION NO. 1070:

Admit as to all three.

REQUEST FOR ADMISSION NO. 1071:

The interior surfaces of certain storage tanks utilized by the City of Bernardino had been coated with a cold-applied coal-tar product called "Bitumastic Super Tank Solution." manufactured by Koppers Company, Inc.

RESPONSE TO REQUEST FOR ADMISSION NO. 1071:

Admit some of the interior surfaces of at least one storage tank was coated with "Bitumastic Super Tank Solution," manufactured by Koppers Company, Inc.

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REQUEST FOR ADMISSION NO. 1072:

The interior surfaces of certain other storage tanks utilized by the City of Bernardino had been coated with Tnemac [sic] 46-465 Hi-Build Coal Tar Coating, a cold-applied coal-tar product manufactured by Tnemac [sic] Company, Inc., Kansas City, Missouri.

RESPONSE TO REQUEST FOR ADMISSION NO. 1072:

Admit some interior surfaces of some storage tanks were coated with Tnemec 46-465.

REQUEST FOR ADMISSION NO. 1073:

Tetrachloroethylene, also called perchloroethylene, was formerly a constituent of the following cold-applied coal-tar products (respond to each):

(a) Bitumastic Super Tank Solution (prior to 1983);

(b) Tnemac [sic] 46-465 Hi-Build Coal Tar Coating (prior to 1981); and

(c) Engard 800.

RESPONSE TO REQUEST FOR ADMISSION NO. 1073:

As to (a), admit that perchloroethylene was a constituent of such product for some period or periods of time prior to 1983. As to (b) and (c), despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 1074:

Prior to or during their application, [sic] tetrachloroethylene was used to "cut" (i.e., to blend, thin, or bind with) the coal-tar products.

RESPONSE TO REQUEST FOR ADMISSION NO. 1074:

Objection: the request is vague and misleading. Assuming the request refers to the three products identified in Request No. 1073, see Response No. 1073. Notwithstanding that objection, despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with

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a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 1075:

In addition to tetrachloroethylene, each of the following substances was a constituent of Bitumastic Super Tank Solution manufactured prior to 1983 (respond to each);

(a) Toluene (also called "toluol")' and

(b) Xylene (also called "xylol").

RESPONSE TO REQUEST FOR ADMISSION NO. 1075:

Object: see Response to Request No. 1073 as to tetrachloroethylene. Notwithstanding that objection, responding party admits that xylol was a component of Bitumastic Super Tank Solution manufactured during some period or periods prior to 1983. As to tolulene, despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 1076:

In addition to tetrachloroethylene, xylene was constituent of the Tnemac [sic] 46-465 Hi-Build Coal Tar Coating manufacturing prior to 1981.

RESPONSE TO REQUEST FOR ADMISSION NO. 1076:

Object: see response to Request No. 1073 as to tetrachloroethylene. Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

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REQUEST FOR ADMISSION NO. 1077:

In addition to tetrachloroethylene, each of the following was a constituent of Engard's 800 Super Tank Coating, manufactured by Engard Coatings Corporation, Hunting Beach, California (respond to each);

(a) Methyl isobutylketone (MUBK);

(b) Toluene; and

(c) Xylene.

RESPONSE TO REQUEST FOR ADMISSION NO. 1077:

Object: see response to Request No. 1073 as to tetrachloroethylene. Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 1078:

Tetrachloroethylene leached from each of the following cold-applied coal-tar products into the water contained within the tank (respond to each);

(a) Bitumastic Super Tank Solution manufactured prior to 1981; and

(b) Tnemac [sic] 46-465 Hi-Build Coal Tar Coating manufactured prior to 1981; and

(c) Engard's 800 Super Tank Coating.

RESPONSE TO REQUEST FOR ADMISSION NO. 1078:

Objection: the request is vague and misleading. See Response to Request No. 1073. Notwithstanding that objection, responding party states that despite despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

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REQUEST FOR ADMISSION NO. 1079:

The rate at which tetrachloroethylene leaches into water from Bitumastic Super Tank Solution manufactured prior to 1983 and Tnemac [sic] 46-465 Hi-Build Coal Tar Coating manufactured prior to 1981 is dependent upon each of the following *inter alia* (respond to each):

(a) Temperature of the surrounding air;

(b) Relative humidity of the surrounding air;

(c) Rate of ventilation within the tank; and

(d) Thickness of applied coating.

RESPONSE TO REQUEST FOR ADMISSION NO. 1079:

Object: the request is vague and misleading. See Response to Request No. 1073 as to tetrachloroethylene. Responding party further objects because the request makes little logical sense in that, while the listed variables might have an effect on a solvent's evaporation rate, they should have little, if any, effect on the rate of leaching into water. Notwithstanding those objections, responding party states that despite diligent search and reasonable inquiry it lacks sufficient information to admit or deny the request.

REQUEST FOR ADMISSION NO. 1080:

Bitumastic Super Tank Solution was once the most commonly used cold-applied coal tar product to coat the interior surfaces of potable water storage tanks within the State of California.

RESPONSE TO REQUEST FOR ADMISSION NO. 1080:

After diligent search and reasonable inquiry, responding party lacks sufficient information to admit or deny the request.

REQUEST FOR ADMISSION NO. 1081:

The specifications of Koppers Company, Inc. on installation and curing call for the forced-air ventilation during curing of Bitumastic Super Tank Solution.

RESPONSE TO REQUEST FOR ADMISSION NO. 1081:

Admit that a Technical Data Sheet in the responding party's possession for Koppers Bitumastic Super Tank Solution states "Use with Adequate Ventilation" and "[f]orced

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ventilation is necessary to insure thorough evaporation and removal of all solvents in the coatin on the tanks or pipe line systems."

REQUEST FOR ADMISSION NO. 1082:

Koppers Company, Inc. specified a ten-day forced-air ventilation period during curing of Bitumastic Super Tank Solution.

RESPONSE TO REQUEST FOR ADMISSION NO. 1082:

See Response to Request No. 1081. Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used as the basis of this Request. If Defendant will provide responding party with a copy of the document(s) so relied upon, within two weeks of receipt thereof, the City will supplement its answer to this Request accordingly.

REQUEST FOR ADMISSION NO. 1083:

Employees of the City of San Bernardino, as well as painting contractors and water suppliers engaged by the City of San Bernardino, did not follow or were unaware of the manufacturer's specifications regarding a ten-day forced-air ventilation period during curing of Bitumastic Super Tank Solution.

RESPONSE TO REQUEST FOR ADMISSION NO. 1083:

Objection: the request is vague and misleading. See Responses to Requests Nos. 1081 and 1082. Notwithstanding that objection responding party states that despite diligent search and reasonable inquiry, it was unable to locate in its files the document(s) apparently used as the basis of this request. If Defendant will provide responding party with a copy of the document(s) so relied upon, within two weeks of receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 1084:

Employees of City of Bernardino, as well as painting contractors and water suppliers engaged by the City of San Bernardino, generally applied the Bitumastic Super Tank Solution upon the interior surfaces of potable water storage tanks during the winter months.

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RESPONSE TO REQUEST FOR ADMISSION NO. 1084:

Object because the request is vague and ambiguous. Notwithstanding that objection, deny.

REQUEST FOR ADMISSION NO. 1085:

As the Bitumastic Super Tank Solution was being cured within the City of San Bernardino's potable water storage tanks, their bottom-access hatches were closed.

RESPONSE TO REQUEST FOR ADMISSION NO. 1085:

Object because the request is vague and ambiguous. Notwithstanding that objection, deny.

REQUEST FOR ADMISSION NO. 1086:

Tetrachloroethylene has been detected in samples of water collected from potable water storage tanks owned or operated by the City of San Bernardino that had been coated with each of the following cold-applied coal-tar products (respond to each):

(a) Bitumastic Super Tank Solution manufactured prior to 1983; and

(b) Tnemac [sic] 46-465 Hi-Build Coal Tar Coating manufactured prior to 1981.

RESPONSE TO REQUEST FOR ADMISSION NO. 1086:

Admit as to both.

REQUEST FOR ADMISSION NO. 1087:

The City of Bernardino utilized a potable water storage tank denoted as "Mountain Tank."

RESPONSE TO REQUEST FOR ADMISSION NO. 1087:

Admit.

REQUEST FOR ADMISSION NO. 1088:

Tetrachloroethylene was detected at a concentration of 810 ppb (ug/L) in a sample of water collected from "Mountain Tank" on or about September 2, 1982.

RESPONSE TO REQUEST FOR ADMISSION NO. 1088:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the analytical report apparently referenced by this Request and thus lacks sufficient

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information to admit or deny it. If Defendant will provide responding party with a copy of the report containing the analytical results at issue, within two weeks of its receipt, the City will supplement its answer to this Request accordingly.

REQUEST FOR ADMISSION NO. 1089:

The interior surface of the "Mountain Tank" had been coated with Bitumastic Super Tank Solution between March 14, 1982 and April 1982.

RESPONSE TO REQUEST FOR ADMISSION NO. 1089:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the analytical report apparently referenced by this request and thus lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the report containing the analytical results at issue, within two weeks of its receipt, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 1090:

The interior surface of the "Mountain Tank" had been coated with Bitumastic Super Tank Solution by employees of the City of Bernardino.

RESPONSE TO REQUEST FOR ADMISSION NO. 1090:

Admit.

REQUEST FOR ADMISSION NO. 1091:

Following its application, the Bitumastic Super Tank Solution was allowed to cure for a period of eleven days.

RESPONSE TO REQUEST FOR ADMISSION NO. 1091:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

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REQUEST FOR ADMISSION NO. 1092:

Following application of the Bitumastic Super Tank Solution, the Mountain Tank was not subjected to forced-air ventilation period [sic].

RESPONSE TO REQUEST FOR ADMISSION NO. 1092:

Deny.

REQUEST FOR ADMISSION NO. 1093:

On or about September 24, 1982, the contents of Mountain Tank were drained by or on behalf of the City of Bernardino.

RESPONSE TO REQUEST FOR ADMISSION NO. 1093:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 1094:

When the contents of Mountain Tank were drained, the tetrachloroethylene contaminated water was discharged, recharged, or otherwise permitted to enter into the underlying groundwater aquifer.

RESPONSE TO REQUEST FOR ADMISSION NO. 1094:

Deny.

REQUEST FOR ADMISSION NO. 1095:

The City of Bernardino did not treat or cause to be treated the tetrachloroethylene-contaminated [sic] prior to its release into the underlying groundwater aquifer.

RESPONSE TO REQUEST FOR ADMISSION NO. 1095:

Deny.

REQUEST FOR ADMISSION NO. 1096:

When the contents of Mountain Tank were drained, the tetrachloroethylene therein became a constituent of the Newmark plume.

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RESPONSE TO REQUEST FOR ADMISSION NO. 1096:

Deny.

REQUEST FOR ADMISSION NO. 1097:

Each of the following four storage tanks had been coated with Tnemac [sic] 46-465 Hi Build Coal Tar Coating that had been manufactured prior to 1981 (respond to each):

(a) Tank 1720;

(b) Tank 1895;

(c) Tank 2100; and

(d) Del Rosa No. 3.

RESPONSE TO REQUEST FOR ADMISSION NO. 1097:

Admit that the four listed tanks were coated with Tnemec 46-465 coating, but despite diligent search and reasonable inquiry, responding party lacks sufficient information to admit or deny whether said coating was manufactured prior to 1981.

REQUEST FOR ADMISSION NO. 1098:

The interior surfaces of each of the following storage tanks had been coated by work crews other than employees of the City of San Bernardino (respond to each):

(a) Tank 1720;

(b) Tank 1895:

(c) Tank 2100; and

(d) Del Rosa No. 3.

RESPONSE TO REQUEST FOR ADMISSION NO. 1098:

Admit as to all four.

REQUEST FOR ADMISSION NO. 1099:

Tetrachloroethylene has been detected at the indicated concentrations (along with toluene and xylene) in samples of water collected from the indicated storage tanks (respond to each):

(a) Tank 1720, 1.7 ppb (September 7, 1982);

(b) Tank 1895, 0.3 ppb (July 23, 1982);

(c) Tank 2100, 2.5 ppb (September 7, 1982); and

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(d) Del Rosa No. 3, 16.0 ppb (July 23,1992 and August 4, 1982) and 14.0 ppb (August 7, 1982).

RESPONSE TO REQUEST FOR ADMISSION NO. 1099:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 1100:

In August 1982, the Department of Health Services of the State of California alerted the large public water systems within the State of its concern regarding possible organic chemical contamination resulting from improper selection, application, and use of coating for water storage facilities.

RESPONSE TO REQUEST FOR ADMISSION NO. 1100:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 1101:

Tetrachloroethylene from Bitumastic Super Tank Solution manufactured prior to 1983 leaches into water even 10 to 15 years following application as an interior tank coating.

RESPONSE TO REQUEST FOR ADMISSION NO. 1101:

Objection: the request is vague and misleading and the answer depends upon so many unique circumstances and variables it is impossible for responding party to formulate a meaningful response, and despite its diligent search and reasonable inquiry responding party lacks sufficient information to admit or deny the request.

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REQUEST FOR ADMISSION NO. 1102:

Tetrachloroethylene from Tnemac [sic] 46-465 Hi-Build Coal Tar Coating manufactured prior to 1981 leaches into water even 10 to 15 years following their respective applications as an interior tank coating.

RESPONSE TO REQUEST FOR ADMISSION NO. 1102:

Objection: the request is vague and misleading and the answer depends upon so many unique circumstances and variables it is impossible for responding party to formulate a meaningful response, and despite its diligent search and reasonable inquiry responding party lacks sufficient information to admit or deny the request.

REQUEST FOR ADMISSION NO. 1103:

Each of the following is a constituent of chlorinated water (respond to each):

(a) Bromodichloromethane;

(b) Bromeform;

(c) Chloroform; and

(d) Dibromochloromethane.

RESPONSE TO REQUEST FOR ADMISSION NO. 1103:

Object; the request is vague and ambiguous. It does not specify whether it refers to all chlorinated water, to responding party's water, or to a specific sample. Notwithstanding that objection, responding party denies as to all four.

REQUEST FOR ADMISSION NO. 1104:

Each of the following is sometimes referred to as a "trihalomethane" ("THM") (respond to each):

(a) Bromodichloromethane;

(b) Bromoform;

(c) Chloroform; and

(d) Dibromochloromethane.

RESPONSE TO REQUEST FOR ADMISSION NO. 1104:

Admit as to all four.

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REQUEST FOR ADMISSION NO. 1105:

Each of the trihalomethanes noted in the previous Request for Admission has been identified in samples of water collected from the "Mountain Tank."

RESPONSE TO REQUEST FOR ADMISSION NO. 1105:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 1106:

The total THM concentration detected in a sample of water collected from Tank 1720 on September 7, 1982 was 20.5 ppb.

RESPONSE TO REQUEST FOR ADMISSION NO. 1106:

Despite diligent search and reasonable inquiry, responding party was unable to locate in its files the document(s) apparently used by propounding party as the basis for this request and lacks sufficient information to admit or deny it. If Defendant will provide responding party with a copy of the document(s) so used, within two weeks of its receipt thereof, the City will supplement its answer to this request accordingly.

REQUEST FOR ADMISSION NO. 1107:

The East Bay Municipal Utility District has reported the detection of tetrachorolethylene in samples of water collected from four distribution reservoirs.

RESPONSE TO REQUEST FOR ADMISSION NO. 1107:

Despite diligent search and reasonable inquiry, responding party lacks sufficient information to admit or deny the request.

REQUEST FOR ADMISSION NO. 1108:

Between 1930 and the present the City of San Bernardino has directly contributed to the contamination in its municipal water-supply by the following contaminants (respond to each):

(a) Tetrachloroethylene; and

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(b) Chloroform.

RESPONSE TO REQUEST FOR ADMISSION NO. 1108:

Deny as to both.

REQUEST FOR ADMISSION NO. 1109:

Trichloroethylene is one of several byproducts resulting from the biological degradation of tetrachoroethylene, by the anaerobic bacteria present in groundwater.

RESPONSE TO REQUEST FOR ADMISSION NO. 1109:

Responding party admits that TCE can be one of the byproducts resulting from the biological degradation of PCE by anaerobic bacteria present in groundwater.

REQUEST FOR ADMISSION NO. 1110:

Between 1930 and the present the City of San Bernardino has contributed to the trichloroethylene contamination in its municipal water-supply wells in the northern San Bernardino/Muscoy region.

RESPONSE TO REQUEST FOR ADMISSION NO. 1110:

Deny.

REQUEST FOR ADMISSION NO. 1111:

The City of San Bernardino Fire Department has used smoke pots in training exercises.

RESPONSE TO REQUEST FOR ADMISSION NO. 1111:

Deny.

REQUEST FOR ADMISSION NO. 1112:

The City of San Bernardino Fire Department has used smoke pots in training exercises on land above the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 1112:

Deny.

REQUEST FOR ADMISSION NO. 1113:

The City of San Bernardino Fire Department has used smoke pots in training exercises on land upgradient of the Newmark-Muscoy groundwater contamination.

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RESPONSE TO REQUEST FOR ADMISSION NO. 1113:

Deny.

REQUEST FOR ADMISSION NO. 1114:

The City of San Bernardino Fire Department has used smoke generating devices in training exercises.

RESPONSE TO REQUEST FOR ADMISSION NO. 1114:

Admit.

REQUEST FOR ADMISSION NO. 1115:

The City of San Bernardino Fire Department has used smoke generating devices in training exercises on land above the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 1115:

Deny.

REQUEST FOR ADMISSION NO. 1116:

The City of San Bernardino Fire Department has used smoke generating devices in training exercises on land upgradient of the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 1116:

Deny.

REQUEST FOR ADMISSION NO. 1117:

The City of San Bernardino Fire Department has used fire extinguishers in training exercises.

RESPONSE TO REQUEST FOR ADMISSION NO. 1117:

Admit.

REQUEST FOR ADMISSION NO. 1118:

The City of San Bernardino Fire Department has used fire extinguishers in training exercises on land above the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 1118:

Deny.

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REQUEST FOR ADMISSION NO. 1119:

The City of San Bernardino Fire Department has used fire extinguishers in training exercises on land upgradient of the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 1119:

Deny.

REQUEST FOR ADMISSION NO. 1120:

The City of San Bernardino Fire Department has used -solvent-based fire extinguishers in training exercises.

SPONSE TO REQUEST FOR ADMISSION NO. 1120:

Deny.

REQUEST FOR ADMISSION NO. 1121:

The City of San Bernardino Fire Department has used solvent-based fire extinguishers in training exercises on land above the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 1121:

Deny.

REQUEST FOR ADMISSION NO. 1122:

The City of San Bernardino Fire Department has used solvent-based fire extinguishers in training exercises on land upgradient of the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 1122:

Deny.

REQUEST FOR ADMISSION NO. 1123:

The City of San Bernardino Fire Department has used carbon tetrachloride fire extinguishers in training exercises.

RESPONSE TO REQUEST FOR ADMISSION NO. 1123:

Deny.

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REQUEST FOR ADMISSION NO. 1124:

The City of San Bernardino Fire Department has used carbon tetrachloride- fire extinguishers in training exercises on land above the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 1124:

Deny.

REQUEST FOR ADMISSION NO. 1125:

The City of San Bernardino Fire Department has used carbon tetrachloride fire extinguishers in training exercises on land upgradient of the Newmark-Muscoy groundwater contamination.

RESPONSE TO REQUEST FOR ADMISSION NO. 1125:

Deny.

Dated: July 15, 1999

Respectfully submitted,

GRESHAM, SAVAGE, NOLAN & TILDEN, LLP

By: _____
Thomas N. Jacobson
Penelope Alexander-Kelley
Lisa Stolzy

PATTON BOGGS LLP

Dated: July 15, 1999

By: Russell V. Randle (PAW)
Russell V. Randle
Mary Beth Bosco
Paul A. J. Wilson

ATTORNEYS FOR PLAINTIFF,
City of San Bernardino,
Municipal Water Department

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VERIFICATION

STATE OF CALIFORNIA, COUNTY OF SAN BERNARDINO

I have read the foregoing PLAINTIFF CITY OF SAN BERNARDINO MUNICIPAL WATER DEPARTMENT'S RESPONSE TO DEFENDANT'S THIRD SET OF REQUESTS FOR ADMISSIONS and know its contents.

☒ CHECK APPLICABLE PARAGRAPH

☐ I am a party to this action. The matters stated in the foregoing document are true of my own knowledge except as to those matters which are stated on information and belief, and as to those matters I believe them to be true.

☒ I am ☐ an Officer ☐ a partner ☐ a Deputy General Manager The City of San Bernardino Municipal Water Department, a party to this action, and am authorized to make this verification for and on its behalf, and I make this verification for that reason. ☒ I am informed and believe and on that ground allege that the matters stated in the foregoing document are true. ☐ The matters stated in the foregoing document are true of my own knowledge except as to those matters which are stated on information and belief, and as to those matters I believe them to be true.

☐ I am one of the attorneys for _____, a party to this action. Such party is absent from the county of aforesaid where such attorneys have their offices, and I make this verification for and on behalf of that party for that reason. I am informed and believe and on that ground allege that the matters stated in the foregoing document are true.

Executed July 12, 1999, at San Bernardino, California.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Stacey Aldstadt
Type or Print Name

Stacey Aldstadt
Signature

PROOF OF SERVICE

1013A (3) CCP Revised 5/1/88

STATE OF CALIFORNIA, COUNTY OF

I am employed in the county of _____, State of California. I am over the age of 18 and not a party to the within action; my business address is: _____

On _____, 19____, I served the foregoing document described as _____

_____ on _____ in this action

☐ by placing the true copies thereof enclosed in sealed envelopes addressed as stated on the attached mailing list:

☐ by placing ☐ the original ☐ a true copy thereof enclosed in sealed envelopes addressed as follows:

☐ BY MAIL

☐ *I deposited such envelope in the mail at _____, California. The envelope was mailed with postage thereon fully prepaid.

☐ As follows : I am "readily familiar" with the firm's practice of collection and processing correspondence for mailing. Under that practice it would be deposited with U.S. postal service on that same day with postage thereon fully prepaid at _____ California in the ordinary course of business. I am aware that on motion of the party served, service is presumed invalid if postal cancellation date or postage meter date is more than one day after date of deposit for mailing in affidavit.

Executed on _____, 19____, at _____, California.

☐ **(BY PERSONAL SERVICE) I delivered such envelope by hand to the offices of the addressee.

Executed on _____, 19____, at _____, California.

☐ (State) I declare under penalty of perjury under the laws of the State of California that the above is true and correct.

☐ (Federal) I declare that I am employed in the office of a member of the bar of this court at whose direction the service was made.

Type or Print Name

Signature

STUART'S EXBROOK TIMESAVER (REVISED 5/1/88)
NEW DISCOVERY LAW 2030 AND 2031 C.C.P
(May be used in California State or Federal Courts)

*(BY MAIL SIGNATURE MUST BE OF PERSON DEPOSITING ENVELOPE IN MAIL SLOT, BOX, OR BAG)

**(FOR PERSONAL SERVICE SIGNATURE MUST BE THAT OF MESSENGER)

IN SAN DIEGO COUNTY LOCAL RULE 67 REQUIRES "ALL PROOFS OF SERVICE FILED WITH THE COURT AS OF JULY 1 1990 MUST SPECIFY THE NAME OF THE PARTY SERVED THE NATURE AND STATUS OF HIS/HER INVOLVEMENT IN THE CASE IE PLAINTIFF DEFENDANT CROSS COMPLAINANT ETC AND THE NAME ADDRESS AND PHONE NUMBER OF HIS/HER COUNSEL OF RECORD

United States Summary Judgment Motion, Ex. 73, Page 1022

PROOF OF SERVICE

STATE OF CALIFORNIA, COUNTY OF SAN BERNARDINO

Re: **THE CITY OF SAN BERNARDINO MUNICIPAL WATER DEPARTMENT vs. THE UNITED STATES OF AMERICA, DEPARTMENT OF THE ARMY Case No. CV 96-5205 MRP (JGx) and CV 96-8867 MRP (JGx)**

I am employed in the County of San Bernardino, State of California. I am over the age of 18 years and not a party to the within action; my business address is: 600 N. Arrowhead Avenue, Suite 300, San Bernardino, CA 92401.

On July 15, 1999, I served a copy of the within document described as **PLAINTIFF CITY OF SAN BERNARDINO MUNICIPAL WATER DEPARTMENT'S RESPONSE TO DEFENDANT'S THIRD SET OF REQUESTS FOR ADMISSION** on the interested parties in this action in a sealed envelope addressed as follows:

SEE ATTACHED SERVICE LIST

(✓) **BY MAIL** - I am "readily familiar" with the firm's practice of collection and processing correspondence for mailing. Under that practice, it would be deposited with the United States Postal Service with postage thereon fully prepaid at San Bernardino, California, on the same day in the ordinary course of business. I am aware that on motion of the party served, service is presumed invalid if postal cancellation date or postage meter date is more than one day after date of deposit for mailing in affidavit.

( ) **BY PERSONAL SERVICE** - I caused such envelope to be delivered by hand to the offices of the addressee pursuant to C.C.P. '1011.

( ) **BY EXPRESS MAIL/OVERNIGHT DELIVERY** - I caused such envelope to be delivered by hand to the office of the addressee via overnight delivery pursuant to C.C.P. '1013(c), with delivery fees fully prepaid or provided for.

( ) **BY FACSIMILE** - I caused such document to be delivered to the office of the addressee via facsimile machine pursuant to C.C.P. '1013(e). Said document was transmitted to the facsimile number of office of the addressee (*)_ * - *__ from the office of Gresham, Savage, Nolan & Tilden, LLP in San Bernardino, California, on the date set forth above. The facsimile machine I used complied with California *Rules of Court*, Rule 2003(3) and no error was reported by the machine. Pursuant to California *Rules of Court*, Rule 2009(i), I caused the machine to print a transmission record of the transmission, a copy of which is attached to this declaration.

(X) **FEDERAL** - I am employed in the office of a member of the bar of this court at whose direction the service was made.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Executed on July 15, 1999, at San Bernardino, California.

Ann LeMaster

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Exhibit 94

2363-00339
3/22/95
FILE COPY
AR0295

MUSCOY PLUME OPERABLE UNIT

RECORD OF DECISION

PART I: DECLARATION

PART II: DECISION SUMMARY

PART III: RESPONSIVENESS SUMMARY

NEWMARK GROUNDWATER CONTAMINATION SUPERFUND SITE

SAN BERNARDINO, CALIFORNIA

United States Environmental Protection Agency
Region 9 - San Francisco, California

United States Summary
Judgment Motion,
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RECORD OF DECISION

MUSCOY PLUME OPERABLE UNIT INTERIM REMEDY

PART I. DECLARATION

SITE NAME AND LOCATION

Newmark Groundwater Contamination Superfund Site
Muscoy Plume Operable Unit
San Bernardino, California

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Muscoy Plume Operable Unit, Newmark Groundwater Contamination Superfund site, chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), 42 U.S.C. §§9601 et seq., and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (National Contingency Plan or NCP), 40 CFR Part 300. This decision is based on the administrative record for this operable unit.

In a letter to EPA dated March 21, 1995 the State of California, through the California Environmental Protection Agency's (Cal-EPA) Department of Toxic Substances Control (DTSC) concurred with the selected remedy for the Muscoy Plume Operable Unit.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this Record of Decision (ROD), may present an imminent and substantial endangerment to public health, welfare or the environment.

DESCRIPTION OF THE REMEDY

EPA has selected an interim remedy for the Muscoy plume of groundwater contamination in the Newmark Groundwater Contamination Superfund Site. This portion of the site cleanup is referred to as the Muscoy Plume Operable Unit (OU). An OU is a discrete action that comprises an incremental step toward comprehensively addressing Superfund site problems. The Muscoy Plume OU is an interim action focusing on contamination in the underground water supply in the Bunker Hill Basin of San Bernardino, west of the Shandin Hills (Figures 1 and 2). The portion of the groundwater contamination north and east of the Shandin Hills, called the Newmark OU, was addressed in a separate action (Newmark OU Record of Decision, August 4, 1993). The selected remedy and all of the alternatives presented in the feasibility study were developed to meet the following specific objectives for the Muscoy Plume OU:

- To inhibit migration of groundwater contamination into clean portions of the aquifer;
- To protect downgradient municipal supply wells south and southwest of the Shandin Hills;
- To begin to remove contaminants from the groundwater plume for eventual restoration of the aquifer to beneficial uses. (This is a long-term project objective rather than an immediate objective of the interim action.)

The remedy involves groundwater extraction (pumping) and treatment of 6,200 gallons per minute (gpm) in San Bernardino at the leading edge of the contaminant plume (Fig. 2), which is approximately between Highland Avenue and Base Line Street, west of Interstate 215 and east of Medical Center Drive. The exact number, location and other design specifics of the extraction wells will be determined during the remedial design phase of the project to inhibit the migration of the contaminant plume most effectively.

All the extracted contaminated groundwater shall be treated to remove Volatile Organic Compounds (VOCs) by either of two proven treatment technologies: **granular activated carbon (GAC) filtration** or **air stripping**. EPA determined during the Feasibility Study (December 1994) that these treatment technologies are equally effective at removing VOCs and are similar in cost at this OU. Both technologies have been proven to be reliable in similar applications. The VOC treatment technology which best meets the objectives of the remedy for the Muscoy Plume OU will be determined during the remedial design phase, when more detailed information is available to assess effectiveness and cost.

After treatment, the water shall meet all applicable or relevant and appropriate drinking water standards for VOCs (See Table 2). If air stripping treatment is selected, air emissions shall be treated using the best available control technology (e.g., vapor phase GAC) to ensure that all air emissions meet applicable or relevant and appropriate requirements.

The treated water will be transferred to a public water supply agency for distribution. Groundwater monitoring wells will be installed and sampled regularly to help evaluate the effectiveness of the remedy.

If the public water supply agency does not accept any or all of the treated water (possibly due to water supply needs), any remaining portion of water will be recharged into the aquifer via reinjection wells near the edge of the plume. The number, location and design of the reinjection wells will be determined during the remedial design phase to best meet the objectives of the remedy and meet applicable or relevant and appropriate requirements.

The total duration of the Muscoy Plume OU interim remedy will be approximately 33 years, with the first three years for design and construction. EPA will review this action every five years throughout this interim remedy period and again at the conclusion of this period to ensure that the remedy continues to be protective of human health and the environment.

The remedial action for the Muscoy Plume OU represents a discrete element in the overall long-term remediation of groundwater at the Newmark Groundwater Contamination Superfund Site. The objectives of this interim action (i.e., inhibiting migration of groundwater contamination to clean portions of the aquifer, protecting downgradient municipal supply wells south and

southwest of the Shandin Hills and beginning to remove contaminant mass from the aquifer in the Muscoy plume) are not inconsistent with and will not preclude implementation of any final, overall remedial action or actions selected by EPA in the future for the Newmark Groundwater Contamination Superfund Site.

EPA is the lead agency for this project and the Department of Toxic Substances Control of the State of California Environmental Protection Agency is the support agency.

DECLARATION

This interim action is protective of human health and the environment, complies with federal and state applicable or relevant and appropriate requirements directly associated with this action and is cost effective. This action utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable, given the limited scope of the action. Because this action does not constitute the final remedy for the site, the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element will be addressed at the time of the final response action. Subsequent actions are planned to fully address the principal threats at this site.

Because this interim remedy will result in hazardous substances remaining on-site above health-based levels, EPA shall conduct a review, pursuant to CERCLA Section 121, 42 U.S.C. Section 9621, at least once every five years after commencement of remedial action to ensure that the interim remedy continues to provide adequate protection of human health and the environment.

Keith A. Takc — 3-24-95

Keith A. Takata
Deputy Director for Superfund
Hazardous Waste Management Division

Date

PART II. DECISION SUMMARY

This Decision Summary provides an overview of the Muscoy Plume OU interim remedy, including a description of the nature and extent of contamination to be addressed, the remedial alternatives, the comparative analysis of the remedial alternatives, a description of the selected remedy and the rationale for remedy selection.

1. SITE LOCATION AND DESCRIPTION

The Muscoy Plume OU is located within the Bunker Hill Basin (also known as the Upper Santa Ana River Basin) in San Bernardino, California. The following sections present a basin description, regulatory history, and a summary of the Remedial Investigation and Feasibility Study (RI/FS) activities within the Newmark Groundwater Contamination Superfund Site (hereinafter referred to as the Newmark Superfund Site).

1.1 Description of the Bunker Hill Basin

The groundwater contamination at the Newmark Superfund Site affects a large portion of a 110 square mile aquifer in the San Bernardino Valley of southern California. (Figure 1). The aquifer, known as the Bunker Hill Basin, is bounded by the San Bernardino and San Gabriel Mountains to the north, the Crafton Hills and badlands on the southeast, and by a hydrogeologic barrier formed by the San Jacinto fault along the southwest. (Figure 2) Waters flowing from all parts of the aquifer join in a confined "artesian zone" before leaving the basin where the Santa Ana River crosses the San Jacinto faultline.

The groundwater in this aquifer is a valuable resource, currently serving nearly a half-million residents of San Bernardino, Riverside and surrounding communities. According to the San Bernardino Valley Municipal Water District, the Bunker Hill Basin aquifer is capable of storing approximately 1.6 trillion gallons and producing 81 billion gallons each year.

Coarse erosional material (alluvial and river channel deposits) have accumulated in the this area of the basin to depths of 400 to over 1900 feet, atop bedrock formations that act as barriers to further vertical movement. The Shandin Hills, created by an upward fold in these impermeable bedrock formations, forces groundwater flowing from the north and west to flow around either side of the hills rather than directly south toward the Santa Ana River.

Most of the western portion of the basin is an unconfined aquifer, with no substantial barriers to infiltration from the surface. In the lowest area of the basin (the south-central portion around the Santa Ana River), several extensive clay layers have formed an aquitard, overlying and capping the water-bearing sand and gravel aquifers. This confined portion of the aquifer produces a large supply of water for nearby communities. The aquifer receives rainfall and natural runoff from the surrounding mountains, collected floodwater from rivers, creeks and washes, and water imported from outside the region that is spread over percolation basins.

The Muscoy plume encompasses a portion of the Bunker Hill aquifer located beneath the western portion of the city of San Bernardino and an unincorporated part of San Bernardino County known as the Muscoy community. Residential and commercial use predominates throughout the Newmark Superfund Site. Very little of the area remains undeveloped.

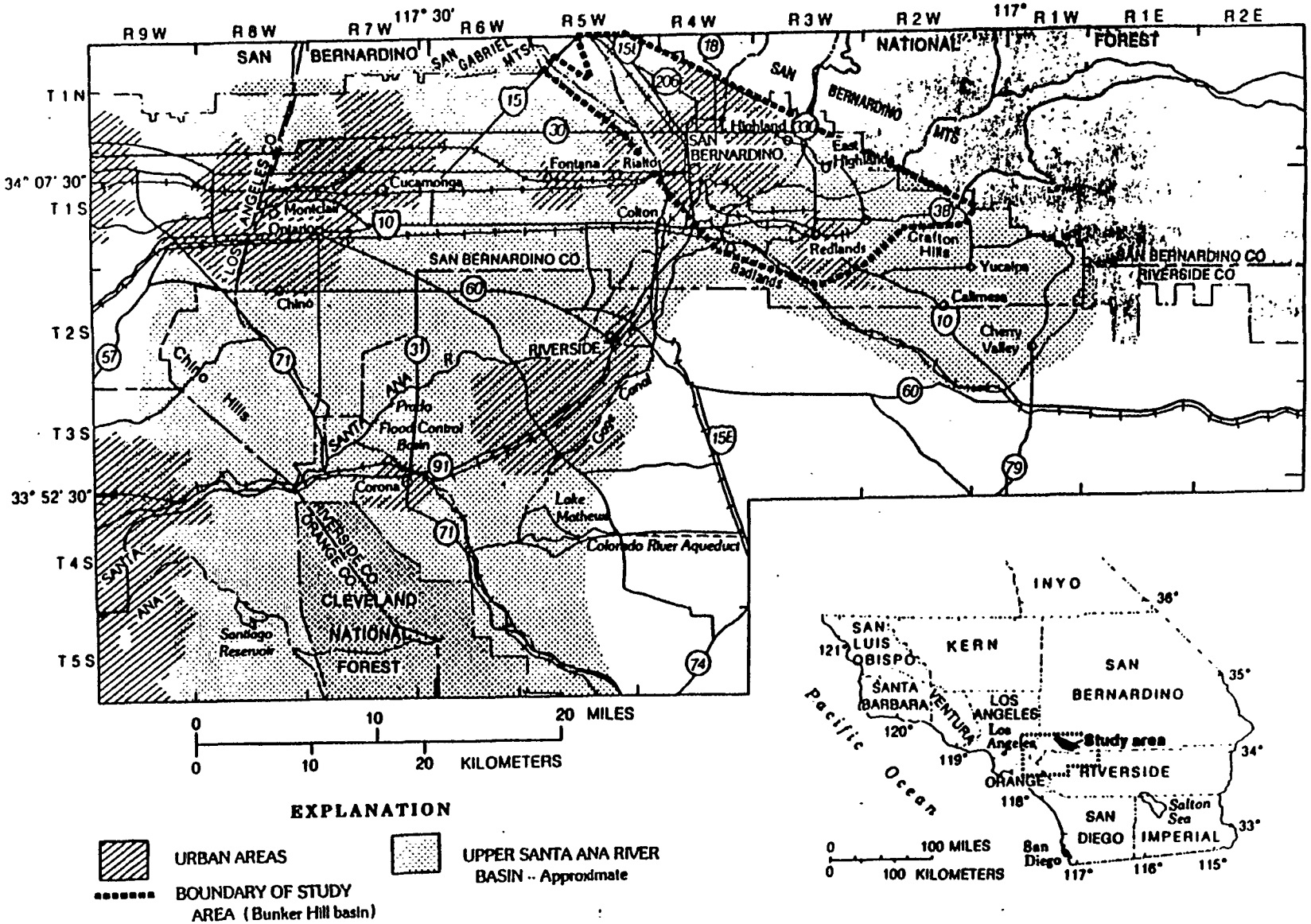

FIGURE 1. Location of Bunker Hill Groundwater Basin, Upper Santa Ana River Valley San Bernardino, California

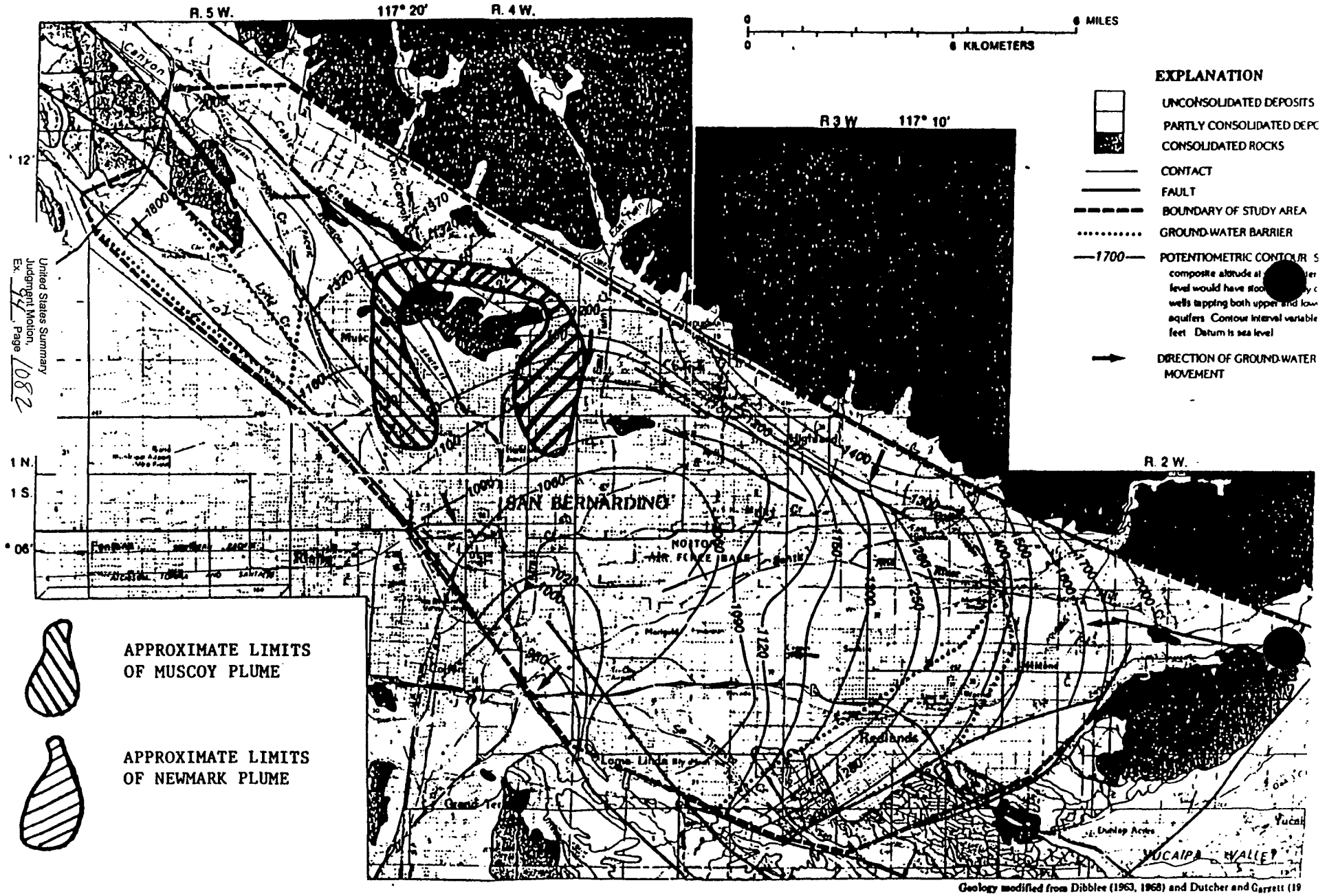

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FIGURE 2. Altitude of Groundwater Surface and Direction of Groundwater Flow (1986)

1.2 Description and Background of the Newmark Superfund Site

The primary contaminants of concern at the Newmark Superfund Site are the solvents **perchloroethylene (PCE) and trichloroethylene (TCE)**, which are widely used in a variety of industries, including dry cleaning, metal plating, and machinery degreasing. These organic solvents are in a class of chemicals, known as volatile organic compounds (VOCs), which evaporate (volatilize) readily at room temperature. If large enough amounts of PCE and TCE are spilled or leaked onto the ground, these chemicals can reach the aquifer where they will slowly dissolve into groundwater. As the contaminated water flows away from the source, a plume of contaminated water can spread many miles downstream. Wells within the plume will be pumping contaminated water.

As of 1995, PCE and TCE in concentrations exceeding the drinking water standards of 5 micrograms per liter (parts per billion) have been detected in 20 public water supply wells in northern San Bernardino. The pattern of contamination, defined by sampling monitoring wells and water supply wells throughout the Newmark Superfund Site (see Figure 3), indicates that a release or releases occurred in northwest San Bernardino (approximately in the area of a former military depot known as the San Bernardino Engineering Depot or Camp Ono), and that contaminants have spread more than five miles toward the Santa Ana river to the southeast. A major outcrop of relatively impermeable bedrock (the Shandin Hills) splits the plume of contaminated groundwater into an eastern branch (the Newmark plume) and a western branch (the Muscoy plume). EPA is addressing the leading edges of the plume as two separate Operable Units. The identification, characterization and remediation of the source of contamination will constitute a third Operable Unit. The RI/FS report for the Newmark OU was finalized in March, 1993, and EPA's Regional Administrator signed a Record of Decision for the Newmark OU interim remedy on August 4, 1993. The Newmark OU Remedial Design was initiated in September, 1993, and is expected to be completed in early 1995.

1.3 Description and Background of the Muscoy Plume Operable Unit

The Muscoy Plume OU encompasses a portion of the Bunker Hill Basin aquifer beneath the northern portion of the city of San Bernardino and an unincorporated portion of San Bernardino County known as the Muscoy community. The Muscoy plume is the western lobe of the Newmark Superfund Site groundwater contamination. This contamination has migrated south of Highland Avenue in San Bernardino along a flow path roughly parallel to the Cajon Wash. The Cajon Wash, a major recharge zone of the Bunker Hill groundwater basin, prevents the contaminants from migrating further west and tends to push the contaminants toward the east. The Shandin Hills bedrock outcrop limits the eastern flow of the Muscoy plume. The leading edge of the Muscoy plume arrived at San Bernardino's 19th Street wells in the mid to late 1980's but has not yet reached the wells at 10th Street, approximately one mile to the southeast. At an estimated flow rate of 300 to 500 feet per year, contaminated groundwater would require ten to twenty years to migrate from the 19th Street wells to the 10th Street wellfields.

The EPA placed the Newmark site on the National Priorities List (NPL) in March, 1989. At that time, EPA believed the eastern (Newmark) plume of contamination to be completely separate from the western (Muscoy) plume of groundwater contamination.

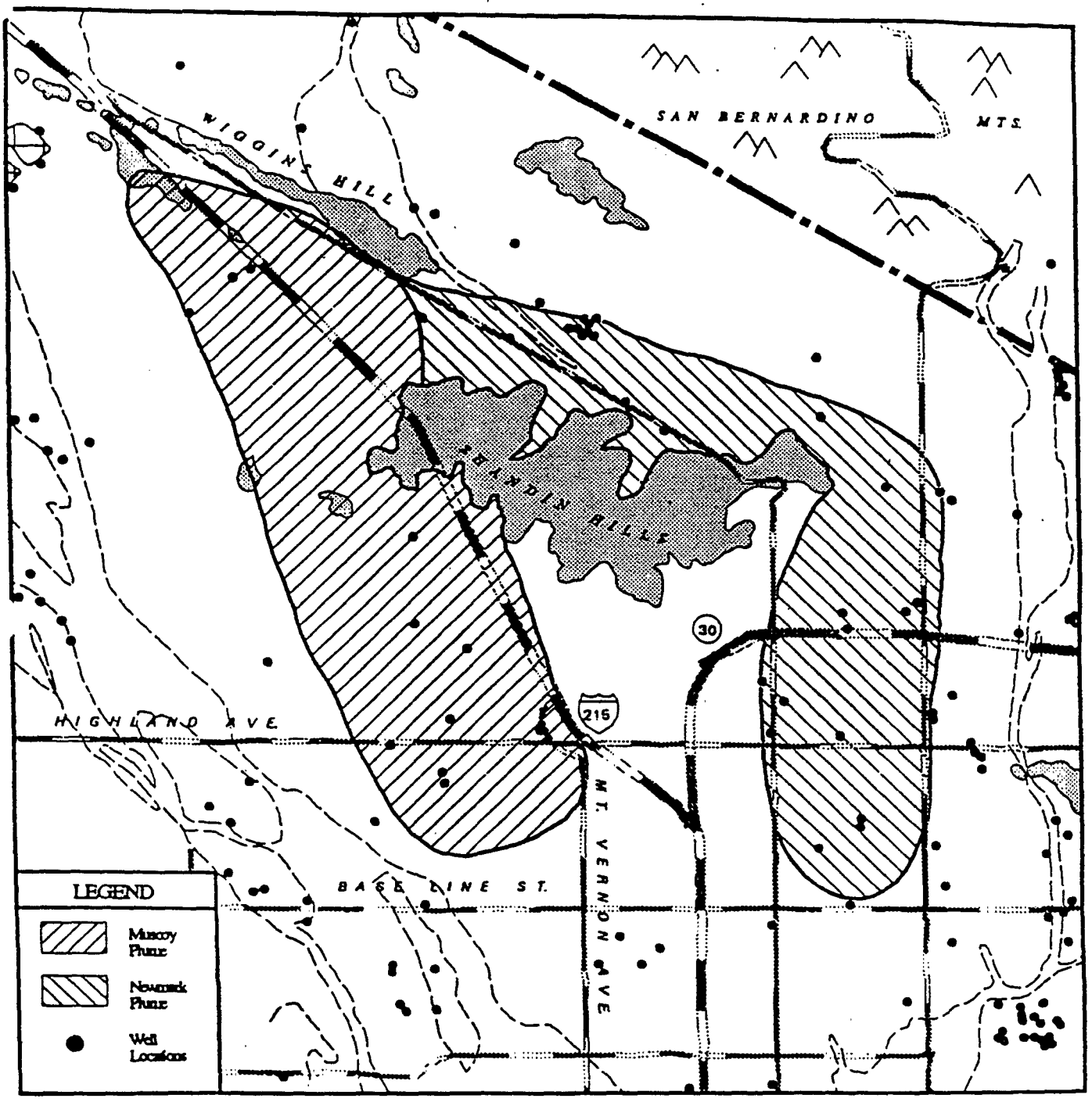

FIGURE 3. Extent of Groundwater Contamination and Well Locations, Newmark Superfund Site - Newmark and Muscoy Plumes

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The EPA Remedial Investigation (RI) began in late 1990, focusing entirely on the Newmark plume. Results from the RI showed that the originally suspected source of the Newmark plume (a disposal pit for waste liquids from a former airport) was not the source of the contamination. Additional well drilling in the summer of 1992 traced the groundwater contamination back through a previously undiscovered underground channel flowing from the western (Muscoy) side of the valley. EPA expanded the Newmark Superfund Site Remedial Investigation in September, 1992 to include the Muscoy plume.

Due to EPA's experience with the Newmark plume and to the availability of over ten years of water quality data from state and local groundwater investigations in San Bernardino, EPA was able to expedite the Remedial Investigation of the Muscoy Plume OU. In 1992 all available wells in the vicinity of the Muscoy plume were sampled by EPA. PCE and TCE were the most prevalent contaminants in all of the contaminated wells. Other VOCs were also detected in trace quantities. These results were consistent with water quality samples analyzed by state and local authorities since 1980.

In 1993, EPA recognized that sufficient information had been collected to develop interim action alternatives to control the spread of the Muscoy plume while proceeding with field work to identify the source. The Muscoy Plume OU has the limited objectives of addressing migration at the leading edge of the plume while EPA continues to investigate the source of the contamination. The RI/FS Report for the Muscoy Plume OU was finalized in December, 1994.

2. SITE HISTORY

In 1980, the California Department of Health Services (DHS) initiated a monitoring program in San Bernardino to test for the presence of industrial chemicals in the water from public supply wells. The results of initial tests and of subsequent testing revealed the presence of PCE and TCE contamination in large portions of the groundwater of the Bunker Hill Basin.

Fourteen wells operated by the city of San Bernardino Water Department in the North San Bernardino / Muscoy area were found to contain concentrations of PCE and TCE above the state and federal MCLs of 5 parts per billion (ppb) for both TCE and PCE. The solvents were found in wells scattered around the north, east and west sides of the Shandin Hills. (Figure 3) The affected wells had supplied nearly 25 percent of the water for the city of San Bernardino. As of 1995, a total of thirteen public water supply wells have been contaminated by the solvents in the Newmark plume, and seven water supply wells have been affected in the Muscoy plume.

The cities of San Bernardino, Riverside and other water agencies in the area closely monitor the quality of drinking water delivered to residents. These entities have taken the necessary steps to ensure that the water served to residents meets all federal and state drinking water requirements.

Following investigations by the Santa Ana Regional Water Quality Control Board and California Department of Health Services (now the California EPA Department of Toxic Substances Control), the state provided over $6 million to construct four water treatment systems to protect the public water supply. After years of testing it became apparent that the solvents in the groundwater were continuing to flow south, threatening many more wells operated by San

Bernardino, Riverside and other communities. The state requested federal involvement to address this regional problem.

The state investigations published in 1986 and 1989 both suggested that the widespread contamination in northern San Bernardino probably resulted from numerous small, unidentified sources. The Shandin Hills and nearby hill formations were assumed to separate the eastern (Newmark area) aquifer from the western (Muscoy area) aquifer, making it unlikely that all 14 wells could have been contaminated from a single source. However, continued monitoring of existing water supply wells and monitoring wells constructed by the state established a record of contamination relatively uniform in composition and concentration throughout the area north and east of the Shandin Hills. This pattern strongly suggested a single plume in this area.

Aerial photographic analysis of the Newmark Superfund Site was completed by EPA's Environmental Monitoring Systems Laboratory in September, 1990. This analysis, along with interviews of witnesses, suggested that the primary source of contamination was a suspected solvent disposal pit ("cat pit") on the former site of the private San Bernardino Airport. Waste oil and solvents were disposed of at this site from the late 1950's intermittently through the early 1970's. Several minor activities in different parts of the airport site were also identified as potential waste releases. No other sources could be identified between the disposal site and the closest uncontaminated wells upgradient. The waste disposal pit was also within several hundred feet of the Newmark wellfield (four City of San Bernardino Water Department wells). These wells exhibited the highest concentration of contaminants measured in any wells in the area, nearly 200 µg/l (parts per billion) of PCE.

Based on information obtained during the Remedial Investigation, the San Bernardino Airport site is no longer suspected to be the source of the Newmark plume. It is now believed that the principle source (or sources) lies on the west side of the Shandin Hills and is the likely origin of both the Newmark and Muscoy plumes.

While ongoing investigations attempt to definitively identify the source, EPA determined that the continuing migration of the Muscoy plume could be inhibited through an interim remedial action (the Muscoy Plume OU).

3. ENFORCEMENT ACTIVITIES

The results of the Remedial Investigation and other investigations undertaken by EPA and state agencies indicate that the project lead for the Muscoy Plume OU will remain with EPA.

As explained above, the disposal pits at the former San Bernardino Airport site were originally suspected to be the source of the contamination. Considerable effort was expended on a search for Potentially Responsible Parties (PRPs) while the airport site disposal pits were the suspected source. However, results of the Remedial Investigation reveal that the source of the contamination is more than one mile upgradient of the originally suspected source. No residual contamination was found in the unsaturated zone or the upper portion of the aquifer immediately beneath former disposal pits. The airport site is no longer considered a likely source of the contamination.

The current focus of the PRP search is on the potential sources located to the northwest of the Shandin Hills. These potential sources include the San Bernardino Engineering Depot (a WWII-era army base decommissioned in 1947, commonly known as Camp Ono), a closed county landfill (the Cajon landfill), and subsequent industrial activities at the site of the former Camp Ono.

EPA formally requested detailed information from the Department of Defense (DoD) concerning the operations at the former Camp Ono in 1993 and again in 1994. A partial reply to the earlier request was received November, 1993. In this response, the DoD noted that solvents had been used and disposed of at the base. The designated DoD representative reported that research into EPA's 1994 information request has commenced. The Department of Defense was notified of its potential liability in a General Notice letter sent on December 22, 1993. EPA and DoD (through the Army Corps of Engineers) have been communicating regularly regarding the Newmark Superfund Site throughout 1994. On December 16, 1994, the designated representative of the Department of Defense was sent a copy of the Muscoy Plume Proposed Plan, with a transmittal letter stating that the Muscoy Plume OU was the second OU of the Newmark Superfund Site. EPA noted that the previous General Notice letter sent on December 22, 1993, notified DoD of potential liability for the entire Newmark Superfund Site.

4. HIGHLIGHTS OF COMMUNITY PARTICIPATION

EPA's preferred remedial alternative, as well as four other alternatives were described in EPA's Proposed Plan for the Muscoy Plume OU (December 1994). The Proposed Plan was in the form of a fact sheet and was distributed to all parties (approximately 700) on EPA's mailing list for the Newmark project. The public comment period was extended to more than 5 weeks (38 days) to compensate for the holiday period in December. EPA received no requests for extensions from members of the public. The public comment period closed on January 20, 1995. EPA received approximately 16 comments, with a large proportion relating to source characterization rather than control of the Muscoy plume. These comments and EPA's responses to these comments are summarized in Part III (the Responsiveness Summary) of this ROD.

A press release to announce the release of the Proposed Plan was issued December 16, 1994. The press release and the Proposed Plan Fact Sheet announced that a public meeting to discuss and receive comments on the Muscoy Plume Proposed Plan was scheduled for January 10, 1995. Notice of the public meeting as well as the availability of the Proposed Plan was published in the Inland Empire Sun on December 14, 1994. In addition, several newspaper articles were written about the Remedial Investigation, the Feasibility Study and the Proposed Plan for the Muscoy Plume OU. A map of the Muscoy Plume OU was provided in the Proposed Plan and the above-referenced newspaper articles published maps and described the area that would be impacted by the Muscoy Plume OU.

A public meeting was held in the City of San Bernardino Council Chambers on January 10, 1995, to discuss EPA's preferred alternative and the other alternatives. At this meeting EPA gave a brief presentation regarding the Proposed Plan, answered questions, and accepted comments from members of the public. This meeting was broadcast live on the local cable channel.

EPA expended considerable effort developing strong community relations. A Technical Advisory Committee has been successful in maintaining close communication with local and state agencies. For communication with the local community, three principle mechanisms have been employed: formal presentations (open houses, meetings with organizations and fact sheet distribution), contact with the print and electronic media, and informal discussions with home-owners' associations and individuals.

Three different home-owners' associations, the Muscoy Municipal Advisory Council and several water supply agencies accepted EPA's offer for informal discussions of the project. Drilling around these communities was greatly facilitated by open communication, including distribution of four fact sheets. Presentations were made to the staff and teachers at a local school, and the Project Manager taught the 5th grade class about groundwater and chemical pollution as it relates to the project.

5. SCOPE AND ROLE OF THE OPERABLE UNIT

The interim remedial action for the Muscoy Plume OU represents a discrete element in the overall long-term remediation of groundwater contamination in the San Bernardino area. Since the source of the contamination has not been definitively identified, the final overall plan for the remediation of the entire Newmark Groundwater Contamination Site has not yet been determined. The Muscoy plume constitutes a major portion of the contaminated aquifer and the Muscoy Plume OU interim remedial action will be a significant step toward eventual remediation. EPA does not expect the objectives of this interim action to be inconsistent with, or preclude, any final action for the entire site.

The objectives of the Muscoy Plume OU are:

- To inhibit migration of groundwater contamination into clean portions of the aquifer;
- To protect downgradient municipal supply wells south and southwest of the Shandin Hills;
- To begin to remove contaminants from the groundwater plume for eventual restoration of the aquifer to beneficial uses. (This is a long-term project objective rather than an immediate objective of the interim action.)

The analysis of the No Action option indicates that unless this action is implemented, the contamination will continue to spread to clean areas of the aquifer which are currently important sources of drinking water.

When sufficient information is available on the contaminant source and transport from the source, EPA will review and evaluate various groundwater remediation options for the entire Newmark Superfund Site. It is expected that the Muscoy Plume OU remedy will constitute an integral part of the final remedy.

EPA will continue to monitor aquifer behavior and contaminant transport as part of this interim action. The information gathered will be important in the analysis of a remedy for the entire Newmark Superfund Site.

Table 1. Maximum Concentrations of Volatile Organic Compounds Detected (above 0.5 µg/l detection limit) in Wells in the Muscoy Plume

Compound	Maximum Concentration (µg/l)
1,1 Dichloroethane (DCA)	0.8
cis-1,2-Dichloroethene (DCE)	6
Trichloroethene (TCE)	6
Tetrachloroethene (PCE)	27
Dichlorodifluoromethane (Freon 12)	28
Trichlorofluoromethane (Freon 11)	4

6. SUMMARY OF MUSCOY PLUME OU SITE CHARACTERISTICS

EPA's Remedial Investigation provided critical understanding in three general areas: groundwater flow characteristics, contaminant identification and concentration, and potential routes of exposure.

The Remedial Investigation confirmed that most recharge to the Muscoy Plume OU part of the Bunker Hill Basin originates along the San Bernardino and San Gabriel Mountains to the north via the Cajon Wash along the west. Drinking water wells north and west of the site show that this source is not contaminated. Another important observation was that clay or silt layers that would inhibit vertical contaminant migration were not present in wells near the leading edge of the plume. This indicates that contaminants at any depth in the aquifer would not be prevented from entering water supply wells in the area, regardless of the depth of the water supply well. A groundwater flow model was successfully developed to describe the aquifer behavior and proved to be a useful tool in developing remedial alternatives.

The contaminants identified were predominantly chlorinated solvents. (Table 1) Tetrachloroethene (PCE) was found in all contaminated wells at concentrations less than 30 parts per billion (ppb). Trichloroethene (TCE) was the next most common contaminant, and never exceeded 10 ppb. Other related contaminants of concern, cis-1,2-dichloroethene (DCE) and 1,1-dichloroethane (DCA), were identified at concentrations below drinking water standards. Chlorofluorocarbons (freons) were also detected.

Analysis of potential exposure routes during the Remedial Investigation concluded that the only measurable exposure to the VOCs would be through untreated domestic water supply. Several state and EPA investigations failed to identify VOC contamination at the surface or within ten feet of the soil surface anywhere at the Newmark Superfund Site. Consequently, direct contact with VOC's via surface soil is not a possible exposure route. Further EPA investigations examined the potential for volatile chemicals to enter residences through the soil. Direct in-home measurements confirmed EPA calculations that this also is not a possible exposure route. Exposure through untreated domestic water supply is discussed thoroughly in the Site Risk section below.

7. SUMMARY OF SITE RISKS

Baseline risk assessments are conducted at Superfund sites to fulfill one of the requirements of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The NCP (40 CFR Part 300) requires development of a baseline risk assessment at sites listed on the National Priorities List (NPL) under CERCLA. The CERCLA process for baseline risk assessments is intended to address both human health and the environment. However, due to the nature of the contamination at the site and the highly urbanized setting of the Muscoy Plume OU, the focus of the baseline risk assessment was on human health issues rather than environmental issues.

The objective of the baseline risk assessment for the Muscoy Plume OU was to evaluate the human health and environmental risks posed by the contaminated groundwater if it were to be used as a source of drinking water without treatment. The baseline risk assessment

incorporated the water quality information generated during the RI field investigation and sampling program to estimate current and future human health and environmental risks.

The risk assessment was conducted in accordance with EPA guidance including: Guidance for Conducting Remedial Investigation and Feasibility Studies under CERCLA (USEPA, 1988), Risk Assessment Guidance for Superfund, Vol. I Health Evaluation Manual (Part A) and Vol. 2 Ecological Assessment (USEPA, 1989), The Exposure Factors Handbook (USEPA, 1989), and Risk Assessment Guidance for Superfund Human Health Risk Assessment, USEPA Region IX Recommendations (USEPA, 1989).

A risk assessment involves the qualitative and quantitative characterization of potential health effects of specific chemicals on individuals or populations. The risk assessment process comprises four basic steps: 1) hazard identification, 2) dose-response assessment, 3) exposure assessment, and 4) risk characterization. The purpose of each element is as follows:

- Hazard identification characterizes the potential threat to human health and the environment posed by the detected constituents.

- Dose response assessment critically examines the toxicological data used to determine the relationship between the experimentally administered animal dose and the predicted response (e.g., cancer incidence) in a receptor.

- Exposure assessment estimates the magnitude, frequency, and duration of human exposures to chemicals.

- Risk characterization estimates the incidence of or potential for an adverse health or environmental effect under the conditions of exposure defined in the exposure assessment.

Human Health Risk Assessment

The potential for non-carcinogenic health effects was estimated by calculating a hazard index for the sum of all the compounds of potential concern in the Muscoy plume. The health index compares the levels of contaminants in the groundwater with levels that could cause an adverse non-cancer health effect. If the total hazard index reaches 1.0 or above, there may be a concern for potential health risks. The hazard index for the Muscoy Plume OU was less than 0.5, which indicated that non-carcinogenic health effects are negligible.

The risk assessment also estimated the possibility that additional occurrences of cancer will result from exposure to contamination. The background probability of developing cancer from all causes in California is approximately one in four (or 250,000 in a million). An excess cancer risk of 1 in a million means that a person exposed to a certain level of contamination would increase the risk of developing cancer from 250,000 in a million to 250,001 in a million as a result of the exposure. EPA considers excess cancer risks greater than 100 in a million to be unacceptable.

In preparing risk assessments, EPA uses very conservative assumptions that weigh in favor of protecting public health. For example, EPA may assume that individuals consume two liters

of drinking water from wells situated within a contaminant plume every day for a 30-year period, even though typical exposure to the chemical would be far less.

EPA included two potential exposure routes (ways the contamination gets into the body) in the risk assessment:

- drinking the groundwater during residential use; and
- inhaling the chemicals in groundwater as vapors during showering.

Skin contact with contaminated water was also considered but EPA found that it did not pose a significant risk. Results of the RI indicated that direct exposure to volatile organic compounds (VOCs) from surface soil or from water 100 feet below ground was insignificant at this site (see Section 6.0 - Summary of Site Characteristics).

Chemicals of potential concern in the Muscoy Plume OU used in the risk assessment calculations included: PCE, TCE, cis-1,2-Dichloroethene (DCE), and other VOCs detected in at least one well. EPA will continue to monitor the groundwater in the Muscoy Plume OU for any changes that would affect the risk analysis.

The results of the risk assessment indicated that the current contaminant levels in the aquifer of the Muscoy Plume OU would not meet state or federal drinking water standards if this water were to be delivered directly to local residents, without being treated. However, the levels are currently below the concentrations that would pose an unacceptable risk to human health, as defined by CERCLA. If the groundwater were used as a drinking water source without treatment, the chance of developing cancer during a lifetime would increase by as much as 50 in a million. EPA is taking an action at the Muscoy Plume OU in order to meet the drinking water standards (MCLs) even though the risk levels do not exceed 100 in a million.

The baseline risk assessment for the Muscoy Plume OU is presented in the Remedial Investigation and Feasibility Study Report for the Muscoy Plume OU (December 1994).

Environmental Risk Assessment

Given the present developed condition of the site and the major exposure pathway consideration of contaminated groundwater, there was no expectation for significant impact to potential environmental receptors. Urbanization has already replaced habitat potential; therefore, no significant number of receptors appeared to be present. There appeared to be no apparent mechanism for exposure to environmental receptors from contaminated groundwater. Also, there was no indication that future site plans would reinstate habitat and thereby recreate a potential for environmental receptors in the future.

8. DESCRIPTION OF ALTERNATIVES

Development of Alternatives to Meet Project Objectives

Before developing a range of cleanup alternatives for evaluation, EPA identified the objectives of the interim cleanup for the Muscoy Plume OU. All of the alternatives were screened for: 1) effectiveness at protecting human health and the environment, 2) technical feasibility (implementability), and 3) cost. In addition, the alternatives were developed to meet the specific cleanup objectives for the Muscoy Plume OU described previously.

Based on the results of the RI, EPA identified five cleanup alternatives for addressing groundwater contamination of the Muscoy Plume OU. Detailed descriptions of these alternatives are provided in the Muscoy Plume OU RI/FS Report (December, 1994). Rather than including all potential combinations of extraction locations and amounts, the initial screening process identified the most efficient extraction scenario that would meet our objectives. The five alternatives were evaluated based on nine specific criteria: 1) Overall Protection of Human Health and the Environment, 2) Compliance with Applicable or Relevant and Appropriate Requirements (ARARs), 3) Long-term Effectiveness and Permanence, 4) Reduction of Toxicity, Mobility or Volume through Treatment, 5) Short-term Effectiveness, 6) Implementability, 7) Cost, 8) State Acceptance, and 9) Community Acceptance.

With the exception of the **Alternative 1 - No Action**, all of the alternatives involve the extraction of an estimated 6,200 gallons per minute (gpm) of groundwater near the leading edge of the plume for a period of 30 years. The actual design capacity of the extraction and treatment facilities will be determined during the Remedial Design phase based on the latest refined groundwater information and modeling. The RI/FS Report analysis indicated that the final extraction rate is expected to be within the range of 5,000 gpm to 7,000 gpm. Individual wells would pump from 800 to 2,000 gpm, the range for a typical city drinking water well.

A computer model was used to determine that these extraction rates would result in effective inhibition of plume migration and optimal contamination removal for this interim action. With the exception of **Alternative 1 - No Action**, all of the alternatives would involve the construction and operation of a VOC treatment system, construction and sampling of additional monitoring wells, and analysis of any changes in the current operations of nearby public water supply wells.

During the first three years after issuance of the ROD, the remedy would proceed to the remedial design and initial implementation stages. EPA must plan, build the equipment and test it to make sure it functions properly.

ALTERNATIVE 1: No Action

This alternative serves as a baseline to compare other alternatives. This alternative is evaluated to determine the risks that would be posed to public health and the environment if no action were taken to treat or contain the contamination. The **No Action Alternative** would involve only groundwater monitoring; no additional cleanup activities would be conducted. The cost of constructing the necessary monitoring wells and sampling them over 30 years would be approximately $2.2 million (present net worth).

ALTERNATIVE 2: Extract/Treat(Granular Activated Carbon)/Public Water Agency

Extraction

Alternative 2 involves the extraction of an estimated 6,200 gpm of contaminated groundwater placed at the leading edge of the Muscoy plume. The actual design capacity of the extraction and treatment facilities will be determined during the Remedial Design phase based on the latest refined groundwater information and modeling. The extraction wells would be located to inhibit most effectively the migration of the contaminant plume.

Treatment

The extracted groundwater would be transmitted via underground piping to a Granular Activated Carbon (GAC) treatment plant. EPA assumed that an entirely new treatment plant would be constructed near the extraction system and near a major distribution system pipeline. It may be possible to use an existing treatment plant site with construction of pipeline to the plant and from the plant to the distribution pipeline. Note that Alternative 3, involving treatment by air stripping, is considered by EPA to be equivalent to Alternative 2, and may be substituted for all or part of Alternative 2 during the design phase of the project.

Transfer of Treated Water

The treated water would meet all applicable or relevant and appropriate drinking water standards for VOCs and would be piped to a public water supply agency for distribution. Groundwater monitoring wells would be installed to evaluate the effectiveness of the remedial action. Following approximately 2 to 3 years for design and construction, this system would operate for 30 years. Operation of nearby public water supply wells are not expected to interfere with this remedy, although any significant changes in operations would be analyzed to determine the effect on this cleanup action. EPA will conduct a formal assessment of the project effectiveness every five years.

The present net worth cost of Alternative 2, including capital costs and thirty years of operation and maintenance, is estimated at $26,000,000.

ALTERNATIVE 3: Extract/Treat(Air Stripping with Emission Control)/Public Water Agency

Alternative 3 involves the same extraction system, transfer of treated water to a public water agency and monitoring design as Alternative 2. Alternative 3 differs from Alternative 2 in the treatment of the extracted groundwater to remove VOCs to meet applicable or relevant and appropriate drinking water standards for VOCs. In Alternative 3, the extracted contaminated water would be treated by air stripping with emission control to meet the South Coast Air Quality Management District's requirement for best available control technology. Currently, vapor-phase granular activated carbon meets this requirement, and EPA used this technology for cost and effectiveness analysis. New emissions control technologies developed prior to the final design could be considered if they meet the air quality requirement. Air stripping is essentially equal to GAC (Alternative 2) in effectiveness, technical feasibility and the remaining criteria.

The present net worth cost of Alternative 3, including capital costs and thirty years of operation and maintenance, is estimated at $21,500,000.

ALTERNATIVE 4: Extract/Treat (Advanced Oxidation - Peroxide/Ozone)/ Public Water Agency

Alternative 4 involves the same extraction, transfer of treated water to a public water agency and monitoring design as Alternative 2. The extracted water would be treated for VOCs using an advanced oxidation process that uses peroxide and ozone to destroy (oxidize) the contaminants (rather than transferring the contaminants to a carbon filter). The treated water would meet all applicable or relevant and appropriate drinking water standards for VOCs and would be piped to a public water supply agency. Groundwater monitoring wells would be installed to evaluate the effectiveness of the action.

The present net worth cost of Alternative 4, including capital costs and thirty years of operation and maintenance, is estimated at $32,000,000.

ALTERNATIVE 5: Extract/Treat (GAC or Air Stripping)/Return to the Aquifer via Reinjection.

Alternative 5 involves the same extraction, treatment and monitoring designs as Alternative 2 (including the option to use either GAC or air stripping to treat the extracted water for VOCs). The water would be returned to the aquifer in reinjection wells downgradient from the extraction wells. The treated water would meet state reinjection standards before being returned to the aquifer.

The present net worth cost of Alternative 5, including capital costs and thirty years of operation and maintenance, is estimated at $30,800,000.

9. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

A comparative analysis of the alternatives against the nine evaluation criteria set forth in the NCP at 40 CFR 300.430 (e)(9)(iii) is presented in this section.

No Action versus the Nine Criteria. Clearly, Alternative 1 would not be effective in the short- and long-term in protecting human health and the environment as it does not provide for removing any contaminants from the aquifer, for inhibiting further downgradient contaminant plume migration, or for reducing the toxicity, mobility and volume of contaminants through treatment. Implementing the no-action alternative would be simple and inexpensive since it involves only groundwater monitoring. As indicated by the baseline risk assessment presented in the RI Report, Alternative 1 could pose carcinogenic risk if a person were exposed to the untreated groundwater through the domestic water supply, although the risk is below the 100 in a million excess risk level (10^{-4}) which EPA considers generally unacceptable. The current contaminant level would not meet state or federal drinking water standards if this water were to be delivered directly to local residents without treatment. Loss of a valuable water resource from continued degradation of the aquifer is a major concern for the state and the public.

Overall Protection of Human Health and the Environment, Short Term Effectiveness and Long Term Effectiveness. Alternatives 2, 3, 4 and 5 have the same effectiveness in the short and long term in reducing the risk to human health and the environment by removing contaminants from the aquifer, by inhibiting further downgradient contaminant migration, and by reducing the toxicity, mobility and volume of contaminants in the aquifer.

Reduction of Toxicity, Mobility and Volume through Treatment. The VOC treatment technologies used in Alternatives 2, 3 and 5 (either air stripping with emission control (e.g., vapor-phase GAC adsorption) or liquid phase GAC adsorption) are technically feasible and effective in meeting ARARs for VOCs in the extracted and treated groundwater. Treatment of the extracted contaminated groundwater via air stripping with vapor-phase GAC adsorption or via liquid phase GAC adsorption would reduce substantially the toxicity and mobility of contaminants in the aqueous phase. The adsorption of contaminants onto the GAC would reduce the volume of contaminated media. However, a substantially larger quantity of contaminated GAC media would be generated with either air stripping with vapor-phase GAC or liquid-phase GAC systems compared to perozone oxidation (which is a destructive technology) followed by either air stripping with vapor-phase GAC adsorption or liquid-phase GAC. This contaminated GAC would require disposal or regeneration. During the design phase, an alternative emission control technology will be tested to eliminate the need for vapor-phase GAC while meeting the Best Available Control Technology requirement.

Treatment of the extracted contaminated groundwater via perozone oxidation in Alternative 4 would destroy greater than 90 percent of the VOCs, and generate a smaller quantity of contaminated GAC media compared to the conventional technologies alone. VOC treatment using perozone oxidation has only been tested and applied in pilot-scale/limited applications, and limited O&M data are available. Concern has been expressed over the day-to-day reliability of this innovative technology at large-scale application for drinking water supply treatment. Incomplete oxidation can lead to the formation of by-products such as formaldehyde which would also need to addressed. The reliability concerns for large-scale applications, coupled with the uncertainties associated with design, capital and operational costs and with the fact that a public water supply agency will be receiving the treated water, all combine to make Alternative 4 less preferable than Alternatives 2, 3 and 5 which propose using liquid phase GAC or air stripping for VOC treatment.

Compliance with ARARs. As discussed in the ARARs section (Section 10) of this ROD, since this remedial action is an interim action, there are no chemical-specific ARARs for aquifer cleanup for any of the alternatives. For Alternatives 2 through 4, the chemical-specific ARARs for the treated water from the VOC treatment plant at this site are the federal and state drinking water standards for VOCs set forth in Table 2. Alternative 5 must meet the standards set forth in Table 2 as well as state reinjection standards. Alternatives 2, 3, and 5 are expected to meet these ARARs for the treated water. There is some uncertainty regarding the ability of Alternative 4 to meet these ARARs because perozone has not been used to treat such high concentrations of VOCs at such high flow rates. Therefore, there is the potential for not meeting chemical-specific ARARs unless the air stripping or liquid-phase GAC unit following the perozone system is a redundant treatment system (which would add substantially to the cost).

Implementability. Technically and administratively, Alternatives 2, 3, and 5 could be implemented, although the cooperation of a public water supply agency would be required for implementation of Alternatives 2 and 3. The technologies considered for groundwater monitoring, extraction, and conveyance are proven and have been applied extensively. For Alternative 5, the availability of an appropriate on-site location for reinjection of extracted and treated groundwater would need to be addressed.

State and Public Acceptance. Based on comments received during the public comment period, the public generally expressed support for Alternatives 2 through 5, although reservations were expressed about alternatives 3, 4 and 5. EPA received comments from water agencies in the area specifically in support of the end use aspects of alternatives 2 and 3. Comments received during the public comment period along with EPA responses are presented in Part III of this ROD, the Responsiveness Summary. In a letter dated March 21, 1995, the State of California (Cal-EPA) concurred with EPA's selected remedy for the Muscoy Plume OU.

Cost. The estimated total present worth of Alternatives 2, 3 and 5 ranges from $21,500,000 to $30,800,000. The total present worth cost for Alternative 4 is $32,000,000. For alternatives 2, 3 and 4, some of these costs are expected to be offset by the water supply agencies which accept the treated water. These overall project costs do not take into account the value of utilizing the groundwater resource directly as opposed to recharging the water to the aquifer to be eventually pumped to the surface again prior to use (Alternative 5).

The GAC treatment system already operating at the San Bernardino Municipal Water Department's facility at 19th Street and California Avenue may be incorporated into this action and would provide significant cost savings. Construction of pipeline to a distribution system capable of accepting the full volume of treated water would be required.

Selected Remedy.

EPA's comparative analysis of the remedial alternatives against the nine evaluation criteria concluded that Alternative 2 (extraction, treatment by GAC and transfer to public water supply agency) most fully meets the nine criteria. Accordingly, EPA has selected Alternative 2 as the interim remedial action for the Muscoy Plume OU. Alternative 3, involving treatment by air stripping, is considered by EPA to be equivalent to Alternative 2, and may be substituted for all or part of Alternative 2 during the design phase of the project. In addition, EPA recognizes the need for cooperation from a public water supply agency to implement alternatives 2 or 3. Consequently, EPA selects Alternative 5 (extraction, treatment and reinjection into the aquifer) as a contingency if water supply agencies are unable to accept all of the treated water. Section 11 of the ROD provides a detailed discussion of the major components of the selected remedy.

10. APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

This section discusses Applicable or Relevant and Appropriate Requirements (ARARs) for the selected remedy for the Muscoy Plume OU. Section 121(d) of CERCLA requires that remedial actions attain a level or standard of control of hazardous substances which complies with ARARs of federal environmental laws and more stringent state environmental and facility siting laws. Only state requirements that are more stringent than federal ARARs, and are legally enforceable and consistently enforced may be ARARs.

An ARAR may be either "applicable", or "relevant and appropriate", but not both. The National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300, defines "applicable" and "relevant and appropriate" as follows:

- Applicable requirements are those cleanup standards, standards of control, or other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site. Only those state standards that are identified by a state in a timely manner and that are more stringent than federal requirements may be applicable. "Applicability" implies that the remedial action or the circumstances at the site satisfy all of the jurisdictional prerequisites of a requirement.

- Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site. Only those state standards that are identified in a timely manner and that are more stringent than federal requirements may be relevant and appropriate.

On-site CERCLA actions must comply with the substantive requirements of all ARARs. Off-site activities must comply with both substantive and administrative requirements of all applicable laws. Substantive requirements are requirements that apply directly to actions or conditions in the environment. Examples include quantitative health or risk-based standards for contaminants. Administrative requirements are those mechanisms that assist in the implementation of the substantive requirements (such as reporting, record keeping, and permit issuance), but do not in and of themselves define a level or standard of control. (See 55 Fed. Reg. 8756).

ARARs fall into three broad categories, based on the manner in which they are applied at a site. These categories are as follows:

Chemical-Specific ARARs. Chemical-specific ARARs are health- or risk-based concentration limits, numerical values, or methodologies for various environmental media (i.e., groundwater, surface water, air, and soil) that are established for a specific chemical that may be present in a specific media at the site, or that may be discharged to the site during remedial activities. These

ARARs set limits on concentrations of specific hazardous substances, pollutants, and contaminants in the environment. Drinking water maximum contaminant levels (MCLs) are examples of chemical-specific ARARs.

Location-Specific ARARs. Location-specific ARARs are federal and state restrictions placed on the concentration of a contaminant or on activities to be conducted because they are in a specific location. Examples of restricted locations include flood plains, wetlands, historic places, and sensitive ecosystems or habitats.

Action-Specific ARARs. Action-specific ARARs are technology- or activity-based requirements which determine how a remedial action must be performed. Examples are Resource, Conservation and Recovery Act (RCRA) regulations for hazardous waste treatment, storage or disposal.

Neither CERCLA nor the NCP provides across-the-board standards for determining whether a particular remedy will result in an adequate cleanup at a particular site. Rather, the process recognizes that each site will have unique characteristics that must be evaluated and compared to those requirements that apply under the given circumstances. Therefore, ARARs are identified on a site-specific basis from information about specific chemicals at the site, specific features of the site location, and actions that are being considered as remedies.

The following section outlines the ARARs that apply to the interim remedial action at this site:

10.1 Chemical-Specific ARARs

The chemical-specific ARARs for the contaminants of concern at the Muscoy Plume OU are set forth in Table 2 and discussed in the following sections.

10.1.1 Federal Drinking Water Standards

Safe Drinking Water Act (SDWA), 42 U.S.C. S300f et seq., National Primary Drinking Water Regulations, 40 CFR Part 141.

Federal MCLs and MCLGs

EPA has promulgated Maximum Contaminant Levels (MCLs) under the Safe Drinking Water Act (SDWA) to protect public health from contaminants that may be found in drinking water sources. Although these requirements are only applicable at the tap for water provided directly to 25 or more people or which will be supplied to 15 or more service connections, they are relevant and appropriate to water that is a current or potential source of drinking water. Because the treatment plant effluent from the Muscoy Plume OU is a potential source of drinking water, EPA has determined that the federal MCLs for the VOCs and any more stringent State of California MCLs for these VOCs are relevant and appropriate to the treatment plant effluent. In accordance with NCP section 300.430(e)(2)(i)(B), EPA has also concluded that non-zero Maximum Contaminant Level Goals (MCLGs) are also relevant and appropriate to treatment plant effluent from the Muscoy Plume OU which may be served as drinking water.

The Muscoy Plume OU is an interim remedial action designed primarily to inhibit the

spread of contamination. Consequently, chemical-specific requirements for the ultimate cleanup of the aquifer, which would be ARARs for a final remedy, are not ARARs for this interim action. (See 55 Fed. Reg. 8755.)

Under Alternatives 2 and 3, EPA will transfer the treated groundwater to a public water supply agency. EPA considers the subsequent serving of the water by the public supply agency (at the tap) to be an off-site, post-remedy activity. Consequently, if the treated water is served as drinking water, all legal requirements for drinking water in existence at the time the water is served will have to be met. Since these requirements are not ARARs, they are not "frozen" as of the date of the ROD. Rather, they can change over time as laws and regulations applicable to drinking water change.

10.1.2 State Drinking Water Standards

California Safe Drinking Water Act, Health and Safety Code, §4010 et seq., California Code of Regulations, Title 22, Division 4, Chapter 15, §64401 et seq.

California Maximum Contaminant Levels (MCLs): 22 CCR 64444.5

The State of California has established drinking water standards for sources of public drinking water, under the California Safe Drinking Water Act, Health and Safety Code Sections 4010 et seq. California MCLs for VOCs are set forth at 22 CCR 64444.5. Several of the state MCLs are more stringent than federal MCLs. In these cases, EPA has determined that the more stringent state MCLs for VOCs are relevant and appropriate for the treatment plant effluent from the Muscoy Plume OU interim remedy. The VOCs for which there are more stringent state standards include cis-1,2-dichloroethene (DCE). There are also some chemicals where state MCLs exist but there are no federal MCLs. EPA has determined that these state MCLs are relevant and appropriate for the treated water prior to discharge or delivery to the water purveyor. The VOCs for which there are no federal MCLs but for which state MCLs exist include 1,1-dichloroethane (DCA).

California Secondary Drinking Water Standards (SDWS): 22 CCR 64471

The State of California has also promulgated Secondary Drinking Water Standards (SDWS) applicable to public water system suppliers, which address the aesthetic characteristics of drinking water. See 22 CCR §64471. Although California SDWS are not applicable to non-public water system suppliers, the California SDWS are relevant and appropriate to the Muscoy Plume OU interim action if the treated water is transferred to a public water supply agency for distribution. It should be noted that federal SDWS have not been identified as ARARs for this action because they are not enforceable limits and are intended as guidelines only. In summary, if the treated water is to be served as drinking water, the treated water at the point of delivery must meet the California SDWS for the contaminants of concern at the Muscoy Plume OU. If the treated water is recharged or (temporarily) discharged to surface waters, the water will not be required to meet State SDWS.

Table 2. Chemical -Specific Applicable or Relevant and Appropriate Requirements at the Muscoy Plume Operable Unit for Treated Water Transferred to Public Water Supply Agency

Compound	ARAR (µg/l)	ARAR (Regulation)
1,1 Dichloroethane (DCA)	5	California MCL
cis-1,2-Dichloroethene (DCE)	6	California MCL
Trichloroethene (TCE)	5	Federal MCL
Tetrachloroethene (PCE)	5	Federal MCL
Dichlorodifluoromethane (Freon 12)	--	--
Trichlorofluoromethane (Freon 11)	150	California MCL

Notes:

MCL = Maximum Contaminant Level
"--" indicates that no non-zero MCL, MCLG or SDWS has been promulgated

10.2 Location-Specific ARARs

No special characteristics exist in the Muscoy Plume OU to warrant location-specific requirements. Therefore, EPA has determined that there are no location-specific ARARs for the Muscoy Plume OU.

10.3 Action-Specific ARARs

The action-specific ARARs for the Muscoy Plume OU interim remedy are as follows:

10.3.1 Air Quality Standards

Clean Air Act, 42 U.S.C. §7401 et seq.; California Health & Safety Code §39000 et seq.

South Coast Air Quality Management District Rules 401, 402, 403, 1301-13, 1401

The Muscoy Plume OU alternative treatment of VOCs by air stripping, whereby the volatile chemical compounds are emitted to the atmosphere, triggers action- specific ARARs with respect to air quality.

The Clean Air Act, 42 U.S.C. §7401 et seq., and California Health & Safety Code §39000 et seq., regulate air emissions to protect human health and the environment, and are the enabling statutes for air quality programs and standards. The substantive state and federal ambient air quality standards are implemented primarily through Air Pollution Control Districts. The South Coast Air Quality Management District (SCAQMD) is the district regulating air quality in the San Bernardino area.

The SCAQMD has adopted rules that limit air emissions of identified toxics and contaminants. The SCAQMD Regulation XIV, consisting of Rule 1401, on new source review of carcinogenic air contaminants is applicable for the Muscoy Plume OU. SCAQMD Rule 1401 requires that best available control technology (T-BACT) be employed for new stationary operating equipment, so the cumulative carcinogenic impact from air toxics does not exceed the maximum individual cancer risk limit of ten in one million (1×10^{-5}). EPA has determined that this T-BACT rule is applicable for the Muscoy Plume OU because carcinogenic compounds such as PCE and TCE are present in groundwater, and release of these compounds to the atmosphere may pose health risks exceeding SCAQMD requirements. The substantive portions of SCAQMD Regulation XIII, comprising Rules 1301 through 1313, on new source review are also applicable to the Muscoy Plume OU.

The SCAQMD also has rules limiting the visible emissions from a point source (Rule 401), prohibiting discharge of material that is odorous or causes injury, nuisance or annoyance to the public (Rule 402), and limiting down-wind particulate concentrations (Rule 403). EPA has determined that these rules are also applicable to the Muscoy Plume OU interim remedy.

10.3.2 Water Quality Standards for Reinjection to the Aquifer

If any treated water is reinjected to the aquifer, the treated water must meet all state and

federal action-specific ARARs for such reinjection. The ARARs applicable to reinjection (Alternative 5) are as follows:

Federal Reinjection Standards

Federal Underground Injection Control Regulations: 40 CFR 144.12 - 144.13

The Safe Drinking Water Act, 42 U.S.C. §300f et seq., provides federal authority over injection wells. The Federal Underground Injection Control Plan, codified at 40 C.F.R. Part 144, prohibits injection wells such as those that would be located at the Muscoy Plume OU from (1) causing a violation of primary MCLs in the receiving waters and (2) adversely affecting the health of persons. 40 C.F.R. §144.12. Section 144.13 of the Federal Underground Injection Control Plan provides that contaminated ground water that has been treated may be reinjected into the formation from which it is withdrawn if such injection is conducted pursuant to a CERCLA cleanup and is approved by EPA. 40 C.F.R. §144.13. These regulations are applicable to any Muscoy Plume OU treated water that is reinjected into the aquifer.

Resource Conservation and Recovery Act §3020, 42 U.S.C. §6939b

Section 3020 of the Resource Conservation and Recovery Act (RCRA) is also applicable to the Muscoy Plume OU interim action. This section of RCRA provides that the ban on the disposal of hazardous waste into a formation which contains an underground source of drinking water (set forth in Section 3020(a)) shall not apply to the injection of contaminated groundwater into the aquifer if: (i) such injection is part of a response action under CERCLA; (ii) such contaminated groundwater is treated to substantially reduce hazardous constituents prior to such injection; and (iii) such response action will, upon completion, be sufficient to protect human health and the environment. RCRA Section 3020(b).

State Reinjection Standards

State Water Resources Control Board Resolution 68-16.

State Water Resources Control Board Resolution No. 68-16, which is incorporated in the Santa Ana Regional Water Quality Control Board's Water Quality Control Plan for the Santa Ana River (and specific Bunker Hill sub-basins), is applicable to the Muscoy Plume OU interim action to the extent that treated water is reinjected into the aquifer. Resolution 68-16 requires maintenance of existing state water quality unless it is demonstrated that a change will benefit the people of California, will not unreasonably affect present or potential uses, and will not result in water quality less than that prescribed by other state policies.

The EPA Region IX Regional Administrator's decision in the matters of George Air Force Base and Mather Air Force Base (July 9, 1993) sets forth a balancing process to be used on a case-by-case basis to determine reinjection standards for treated groundwater under Resolution 68-16. This process requires that the following three factors be balanced in order to determine the permitted discharge level: (1) site-specific considerations, including the hydrogeologic conditions at the site, the contaminants discharged, the quality of the receiving water and the designated beneficial uses of the receiving water; (2) treatment technologies; and (3) cost.

Based upon the balancing process set forth in this decision and on a site-specific analysis of the Muscoy Plume OU, EPA has concluded that the substantive reinjection standard for PCE, DCE, TCE, and DCA at the Muscoy Plume OU will be 0.5 ppb on a monthly median basis for each compound. This conclusion is based on data gathered over the last several years at existing state-funded groundwater treatment plants operating at the leading edge of the contaminant plumes of the Newmark Superfund Site. This site-specific information shows that contaminant levels in the groundwater remain within a range that has been consistently treated to below 0.5 ppb TCE/PCE/DCE/DCA using conventional treatment technologies (Granular Activated Carbon and Air-Stripping). The cost, operating and water quality data from these existing treatment plants leads EPA to believe that the 0.5 ppb level can be effectively and economically attained on a monthly median basis assuming essentially identical conditions in the Muscoy Plume remedial action. EPA's analysis relies on data from the existing treatment plants and assumes that EPA will be reinjecting the treated water into relatively clean groundwater at or near the edge of the contaminant plume.

Based on data from existing treatment plants as well as industry-wide treatability studies, EPA has concluded that neither freon 11 nor freon 12 can be treated effectively and economically by liquid-phase or vapor-phase granular activated carbon. More importantly, EPA's Risk Assessment for this Operable Unit shows no increased risk to human health and the environment from freon at this site. EPA has concluded that the reinjection standards for freon 11 is the MCL for freon 11 (150 ppb). It should be noted that the maximum concentration of freon 11 and freon 12 detected in the Muscoy Plume investigation area was 4 ppb for freon 11 and 28 ppb for freon 12.

10.3.3 Water Quality Standards for Temporary Discharges to Surface Water

National Pollutant Discharge Elimination System Program (NPDES)

EPA anticipates that there may be incidental, short-term discharges of groundwater to the San Bernardino County flood control channel or to the City of San Bernardino storm drains during certain remedial activities (for example, during construction of the groundwater extraction system, the VOC treatment plant, and the monitoring wells, during groundwater sampling, and during system maintenance). The ARAR for any groundwater that is discharged, on a short-term basis, to surface waters is the National Pollutant Discharge Elimination System (NPDES) Program which is implemented by the Santa Ana Regional Water Quality Control Board (SARWQCB). Based on the waste discharge limitations adopted by the SARWQCB in Order No. 91-63-043, EPA has determined that groundwater that will be discharged, on a short-term basis, to surface waters on-site must meet state or federal MCLs (whichever is more stringent) for PCE, TCE, DCE, and DCA.

10.3.4 Hazardous Waste Management

California Hazardous Waste Control Act, Health & Safety Code, Division 20, Chapter 6.5

The State of California has been authorized to enforce its own hazardous waste regulations (California Hazardous Waste Control Act) in lieu of the federal RCRA program administered by

the EPA. Therefore, state hazardous waste regulations in the California Code of Regulations (CCR), Title 22, Division 4.5 are now cited as ARARs instead of the federal RCRA regulations.

Under 22 CCR Section 66261.31, certain "spent" halogenated solvents, including TCE and PCE, are listed hazardous wastes (RCRA waste code F002). Although TCE, PCE and certain other halogenated solvents are the contaminants of concern in the groundwater at the Muscoy Plume OU, the source of these contaminants has not yet been determined, and the contaminants cannot therefore be definitively classified as listed RCRA hazardous wastes. However, the contaminants are sufficiently similar to listed RCRA hazardous wastes that EPA has determined that portions of the state hazardous waste regulations are relevant and appropriate to the Muscoy Plume OU interim action.

VOC Treatment Plant Requirements: 22 CCR §§ 66264.14, 66264.18, 66264.25, 66264.600-.603, and 66264.111-.115

The substantive requirements of the following general hazardous waste facility standards are relevant and appropriate to the VOC treatment plant: 22 CCR Section 66264.14 (security requirements), 22 CCR Section 66264.18 (location standards) and 22 CCR Section 66264.25 (precipitation standards).

In addition, an air stripper or GAC contactor would qualify as a RCRA miscellaneous unit if the contaminated water constituted RCRA hazardous waste. EPA has determined that the substantive requirements for miscellaneous units set forth in Sections 66264.600 -.603 and related substantive closure requirements set forth in 66264.111-.115 are relevant and appropriate for the air stripper or GAC contactor. The miscellaneous unit and related closure requirements are relevant and appropriate because the water is similar to RCRA hazardous waste and the air stripper or GAC contactor appear to qualify as miscellaneous units. Consequently, the air stripper or GAC contactor should be designed, operated, maintained and closed in a manner that will ensure the protection of human health or the environment.

Certain other portions of the state's hazardous waste regulations are considered to be relevant but not appropriate to the VOC treatment plant. EPA has determined that the substantive requirements of Section 66264.15 (general inspection requirements), Section 66264.15 (personnel training) and Sections 66264.30-66264.56 (Preparedness and Prevention and Contingency Plan and Emergency Procedures) are relevant but not appropriate requirements for this treatment system. EPA has made this determination because the treatment plant will be required to have health and safety plans and operation and maintenance plans under CERCLA that are substantively equivalent to the requirements of Sections 66264.15, 66264.30-66264.56.

Land Disposal Restrictions: 22 CCR §66268

The land disposal restrictions (LDR) set forth in 22 CCR Section 66268 are relevant and appropriate to on-site disposal of contaminated groundwater on land. The remedial alternatives presented do not include on-site land disposal of untreated groundwater, except as may occur through activities incidental to the remedial activity, such as purging monitoring wells. Any water discharged to land must meet state or federal MCLs, whichever is more stringent, prior to discharge. Such water would not constitute a RCRA hazardous waste and would therefore not trigger LDRs.

The LDRs set forth in 22 CCR 66268 are also relevant and appropriate to the on-site disposal of spent carbon on land. These restrictions would be applicable if the spent carbon contains sufficient quantities of hazardous constituents to render it a characteristic hazardous waste. However, the remedial alternatives presented do not contemplate on-site disposal of spent carbon on land and are therefore unlikely to trigger LDRs.

Storage Requirements: 22 CCR §§66262.34, 66264.170 - 66264.178

The container storage requirements in 22 CCR Sections 66264.170 -.178 are relevant and appropriate for the on-site storage of contaminated groundwater or spent carbon over 90 days. The substantive requirements of 22 CCR Section 66262.34 are relevant and appropriate for the on-site storage of contaminated groundwater or spent carbon for less than 90 days. These requirements would be applicable if the contaminated groundwater or the spent carbon contained sufficient quantities of hazardous constituents to render them characteristic hazardous wastes.

10.4 Other Performance Standards

The NCP authorizes EPA and the state to identify advisories, criteria, guidance or proposed standards to-be-considered (TBCs) that may be helpful or useful in developing CERCLA remedies. NCP, 40 CFR Sections 300.400(g)(3) and 300.430(b)(9). Such TBCs are identified in the RI/FS and may be selected by EPA as requirements for the remedial action in the ROD.

EPA has determined that certain substantive standards for the construction of public water supply wells published by the State of California (the California Water Well Standards) and identified as TBCs in the RI/FS should be requirements for the Muscoy OU interim remedy. While these standards have not been specifically promulgated as an enforceable regulation and are therefore not ARARs, all groundwater facilities designed, located and constructed to produce drinking water must be constructed in accordance with these standards. Since the Muscoy Plume OU interim remedy involves transfer of the treated water to the public water supply agency, EPA has determined that the remedial action will comply with substantive Water Well Standards for construction of water supply wells, such as sealing the upper annular space to prevent surface contaminants from entering the water supply. Standards for location of the extraction wells are not appropriate, since the effectiveness of the remedial action is dependent upon the well locations. Additionally, wells constructed solely for treatment and reinjection with no delivery to the public supply water system will not be subject to these water well construction standards.

11. THE SELECTED REMEDY

Based upon consideration of the requirements of CERCLA, the detailed analysis of the alternatives, and public comments, EPA has determined that Alternative 2: extraction, treatment of VOCs by liquid phase GAC (or air stripping with best available control technology for emissions), and conveyance to a public water supply agency, is the most appropriate interim remedy for the Muscoy Plume OU. If the public water supply agency does not accept any or all of the treated water, then Alternative 5: extraction, treatment of VOCs, and recharge to the aquifer, will be implemented.

Alternative 2 involves groundwater extraction (pumping) of approximately 6,200 gallons per minute (gpm) near the leading edge of the plume for a period of 30 years. The actual design capacity of the extraction and treatment facilities will be determined during the Remedial Design phase based on refined groundwater information and modeling. The RI/FS Report analysis indicated that the final extraction rate is expected to be within the range of 5,000 gpm to 7,000 gpm. Individual wells would pump from 800 to 2,000 gpm, the range for a typical city drinking water well. During the remedial design phase the locations proposed for extraction wells and scenarios for rates of extraction per individual well may be selected or new ones may be selected. The exact number, location and other design specifics of new extraction wells will be determined during the remedial design phase of the project to inhibit the migration of the contaminant plume most effectively.

All the extracted contaminated groundwater shall be treated to remove VOCs by either of two proven treatment technologies: **granular activated carbon (GAC) filtration** or **air stripping**. EPA determined during the Feasibility Study (December 1994) that these treatment technologies are equally effective at removing VOCs and are similar in cost at this OU. Both technologies have been proven to be reliable in similar applications. Existing treatment facilities (e.g., the GAC treatment system at the 19th Street wellfield) may be modified and incorporated into the remedy as appropriate. The VOC treatment technology which best meets the objectives of the remedy for the Muscoy Plume OU will be determined during the remedial design phase, when more detailed information is available to assess effectiveness and cost.

The treated water exiting the treatment plant shall meet all applicable or relevant and appropriate MCLs, non-zero MCLGs and secondary drinking water standards. If air stripping treatment is selected, air emissions shall be treated using the best available control technology (e.g., vapor phase GAC or an acceptable innovative technology) to ensure that all air emissions meet ARARs.

The treated water will be piped to the public water supply agency for distribution. Construction of pipeline to a distribution system capable of accepting the full volume of treated water would be required. It may be possible to use an existing treatment plant site with construction of pipeline to the plant and from the plant to the distribution pipeline.

Groundwater monitoring wells will be installed and sampled regularly to help evaluate the effectiveness of the remedy. More specifically, groundwater monitoring will be conducted no less frequently than quarterly to obtain information needed to: 1) evaluate influent and effluent water quality, 2) determine and evaluate the capture zone of the extraction wells, 3) evaluate the vertical and lateral (including downgradient) migration of contaminants, 4) (if the contingency

alternative is implemented) to evaluate the effectiveness of the recharge well system and its impact on the remedy and 5) to monitor any other factors associated with the effectiveness of the interim remedy determined to be necessary during remedial design. Monitoring frequency may be decreased to less than quarterly if EPA determines that conditions warrant such a decrease.

EPA has selected Alternative 5 as a contingency if the public water supply agency does not accept any or all of the treated water (possibly due to water supply needs). Any remaining portion of water will be recharged into the aquifer via reinjection wells near the edge of the plume. The number, location and design of the reinjection wells will be determined during the remedial design phase to best meet the objectives of the remedy and meet applicable or relevant and appropriate requirements. With the exception of the need to meet state reinjection standards and final use of the treated water, the extraction, treatment and monitoring components of Alternative 5 are identical to Alternative 2 above.

The total duration of the Muscoy Plume OU interim remedy will be approximately 33 years, with the first three years for design and construction. EPA will review this action every five years throughout this interim remedy period and again at the conclusion of this period.

The VOC treatment plant of the Muscoy Plume OU interim remedy (whether it be Alternative 2, Alternative 5 or a combination thereof) shall be designed and operated so as to prevent the unknowing entry, and minimize the possible effect of unauthorized entry, of persons or livestock into the active portion of the facility. A perimeter fence shall be erected around the VOC treatment plant if an adequate fence or other existing security system is not already in place at the plant site. This fence should be in place prior to initiation of the remedial action and should remain in place throughout the duration of the remedy. The VOC treatment plant shall also be designed and operated so as to prevent releases of contaminated groundwater from the plant.

The selected remedy for the Muscoy Plume OU meets all of EPA's nine evaluation criteria. The selected remedy is equally effective as the other alternatives in the short-term and long term reduction of risk to human health and the environment by removing contaminants from the aquifer, by inhibiting further downgradient migration of the contaminant plume, and by reducing the toxicity, mobility and volume of contaminants in the aquifer.

The VOC treatment technologies selected (liquid phase GAC or air stripping with best available control technology for emissions) are technically feasible and proven effective at meeting ARARs for VOCs in the treated groundwater.

Alternative 2, in combination with Alternative 5, could be implemented, both technically and administratively.

In a letter dated March 21, 1995, the State of California concurred with EPA's selected remedy. EPA received several public comments during the public comment period, the majority of which generally expressed support for Alternatives 2 through 5, although reservations were expressed about alternatives 3, 4 and 5. EPA received comments from water agencies in the area specifically in support of the end use aspects of alternatives 2 and 3. These comments, along with EPA's responses are presented in Part III of this ROD, the Responsiveness Summary.

The selected remedy is protective of human health and the environment, meets ARARs, and provides beneficial uses (distribution to a public water supply agency and/or recharge) for the treated water. The selected remedy is cost-effective. The estimated cost of Alternative 2 has a total present worth of $26,000,000, which is in the middle of the range for all five alternatives. The estimated total cost of Alternative 5 is $30,800,000.

12. STATUTORY DETERMINATIONS

As required under Section 121 of CERCLA, the selected interim remedial action is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the interim remedial action, and is cost effective. The selected remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable and satisfies the statutory preference for remedies that employ treatment to reduce toxicity, mobility, and volume as a principal element.

The selected interim remedial action is protective of human health and the environment in that it removes significant VOC contaminant mass from the upper zones of the aquifer and inhibiting further downgradient and vertical migration of contaminated groundwater.

The VOC treatment technologies selected (liquid phase GAC or air stripping with best available control technology for emissions) are technically feasible and proven effective at meeting ARARs for VOCs in the treated groundwater and the air.

The selected remedy permanently and significantly reduces the toxicity, mobility and volume of hazardous substances in the aquifer as well as the extracted groundwater.

Because this remedy will result in hazardous substances remaining on-site above health-based levels, EPA shall conduct a review, pursuant to CERCLA Section 121, 42 U.S.C. Section 9621, at least once every five years after commencement of remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

13. DOCUMENTATION OF SIGNIFICANT CHANGES

No significant changes to EPA's preferred alternative resulted from comments received during the public comment period.

PART III. RESPONSIVENESS SUMMARY

For PUBLIC COMMENTS RECEIVED from

DECEMBER 14, 1994, through JANUARY 20, 1995

ON THE PROPOSED PLAN FOR THE

MUSCOY PLUME OPERABLE UNIT INTERIM REMEDIAL ACTION

AT THE NEWMARK GROUNDWATER CONTAMINATION SUPERFUND SITE,

SAN BERNARDINO, CALIFORNIA

This section summarizes and responds to all significant comments received during the public comment period (38 days) on EPA's proposed interim cleanup plan for the Muscoy Plume Operable Unit of the Newmark Groundwater Contamination Superfund Site in San Bernardino, California. This summary is divided into two parts. Part 1 provides a summary of the major issues raised in written comments contained in three letters received by EPA during the comment period. Part 2 summarizes the questions and comments made during the public meeting on the Proposed Plan held in San Bernardino on January 10, 1995. Copies of all the written comments received by EPA are included in the Muscoy Plume OU Administrative Record, available for review at the information repositories for the Newmark Superfund Site. The transcript of the public meeting, including all the questions and comments made during the meeting, is also available at the information repositories.

1. WRITTEN COMMENTS

1) Commenter (San Bernardino Valley Water Conservation District) emphasizes that, "..it is imperative that the Muscoy plume, as well as the other contaminant plumes, be cleaned up as rapidly as possible." Commenter provides estimate of water in storage in the basin an estimate of volume contaminated.

EPA response: EPA appreciates this expression of support for the interim action at the Muscoy plume. Reaction to a hazardous chemical release must balance the need for rapid response with careful data gathering and analyses. During this project, EPA has maintained a bias toward timely action (such as the Muscoy Plume Interim Action) and will continue to seek opportunities to streamline the process.

2) Commenter recommends consideration of spreading the treated water in an existing gravel pit in the Lytle Creek area as an alternative to reinjection. Commenter notes that reinjection is a

costly alternative.

EPA response: Recharge of treated water to the aquifer will only be considered as a contingency in the event that acceptance by water supply agencies cannot be negotiated. EPA expects that these negotiations will be successful. The Feasibility Study did not identify existing gravel pits suitable for spreading (recharging) water all year round at the volumes necessary to meet the objectives of the Muscoy Plume OU.

3) Commenter (California Regional Water Quality Control Board, Santa Ana Region) expresses support for Alternatives 2 and 3 (Extraction and treatment using Granular Activated Carbon or air-stripping technology). Commenter also emphasizes the importance of protecting downgradient water supply wells.

EPA response: EPA appreciates the careful review and expression of support.

4) Commenter (West San Bernardino Valley Water District) expresses interest in accepting treated water from the cleanup project at a reasonable price if all federal and state water quality requirements are met. This letter was forwarded from the City of San Bernardino Municipal Water Department which is coordinating local water supply agency negotiations to accept treated water from the Newmark Superfund Site interim remedial actions.

EPA response: The active participation of local water supply agencies in the Muscoy Plume OU and the Newmark Superfund Site in general is respectfully acknowledged. Support of the proposed alternative by the water supply agencies of the community is important in the selection of the remedy for this Operable Unit.

2. COMMENTS FROM PUBLIC MEETING HELD JANUARY 10, 1995

Lee Brandt (written and oral comment)

5) Commenter notes that he had played around Camp Ono (potential source area) as a child and has developed serious health problems. Commenter recommends public notice be given to people who played in the area that they were exposed to carcinogens.

EPA response: This comment is about the source and does not directly address the Muscoy Plume interim action. The State of California and EPA searched extensively for surface contamination throughout the potential source area but did not detect any remaining VOCs. Since the contaminants of concern are quite volatile, it would be unusual to detect any significant surface contamination even a year or two after the release. Our analyses do not indicate any current exposure except through untreated groundwater, and the state and local water supply agencies prevent untreated contaminated water from entering the water supply system. Your suggestion about addressing past exposures has been forwarded to the Agency for Toxic Substances and Disease Registry (ATSDR). They have been requested to contact you directly.

Jeff Wright

6) Commenter objects to operation of existing air-stripping towers (at Newmark OU) without emission control systems in light of possible restrictions on backyard barbecues in the region as a result of air quality issues.

EPA response: This comment is indirectly pertinent to the Muscoy Plume OU, in that air-strippers are considered a possible treatment technology for the contaminated groundwater. EPA has committed to meeting the South Coast Air Quality Management District's emission control requirements if this technology is used. The existing air-stripping towers at the Newmark and Waterman wellfields in San Bernardino meet the applicable air quality requirements. Studies conducted by the City of San Bernardino have concluded that current emissions do not pose a health hazard. The comparison of risk from the untreated air emissions versus the risk from partially combusted charcoal from all of the backyard barbecues in San Bernardino is an issue beyond the scope of this Superfund project.

7) Commenter suggests that permitting of the Newmark air-strippers without emission control systems is a breakdown of the environmental regulatory process.

EPA response: As noted above, the existing treatment systems in San Bernardino meet the applicable air quality requirements. Studies conducted by the City of San Bernardino have concluded that current emissions do not pose a health hazard. EPA has committed to meeting the South Coast Air Quality Management District's emission control requirements if the air-stripping technology is used.

8) Commenter feels that regulators have been incapable of preventing the San Bernardino aquifer from being contaminated by two or more Superfund sites.

EPA response: Aquifers like the one beneath San Bernardino are vulnerable to releases of contaminants to the soil surface. It is important to recognize that contamination of the aquifer is believed to have originated more than 20 years ago, from sources that are not likely to reoccur given current regulation of hazardous substances.

Frank Vera

9) The commenter notes that it is misleading to have separate names for the Newmark and Muscoy Plume OUs, when the problem is actually the Camp Ono Contaminant Plume.

EPA response: Operable units are discrete actions that comprise incremental steps toward a comprehensive solution for the entire site. Despite the complexity of the Newmark Superfund Site geology and the difficulties inherent in investigating groundwater contamination 500 feet beneath an urban area, EPA was able to show that the Newmark plume and the Muscoy plume originate from the same area. It has not been established which of several potential sources are responsible for the contamination, and it would be premature to declare this the Camp Ono site.

10) The commenter feels that EPA has made their presentation as if EPA were doing the public a favor when EPA is actually required by law to address the contamination. In addition the

commenter believes that there has not been sufficient effort to uncover the real sources (Manhattan Project, Ethyl Corporation, Kaiser Steel, Culligan Zeolite).

EPA response: The record is clear that EPA is responding to the Newmark site in accordance with the requirements of the CERCLA statute and the National Contingency Plan (NCP) regulations. All the potential sources mentioned as well as many others have been considered by EPA. After analysis of the information gathered to this point, EPA has decided not to pursue the sources mentioned since the nature of chemical usage, location, time frame of operation or a combination of these factors are not consistent with the location and nature of the Newmark Superfund Site groundwater contamination. For example, the Ethyl Corporation facility was located near the leading edge of the Muscoy plume and the pattern of contamination shows that the plume originated miles to the northwest of this facility.

11) The commenter asserts that the source is the former military base (Camp Ono) and the federal government should be cleaning it up. The commenter further states that the source is actually a major military complex that wraps all around the Shandin Hills and includes a former Naval hospital northeast of the Shandin Hills.

EPA response: EPA's investigation into the source (the Source OU) is focusing on the general area of the former San Bernardino Engineering Depot (Camp Ono), although other origins cannot be ruled out. The pattern of contamination is not consistent with releases from potential sources north and east of the Shandin Hills. The pattern of contamination is also inconsistent with releases from the WWII incendiary manufacturing operation southeast of Camp Ono (often referred to as the "bomb plant").

12) The commenter feels that more emphasis must be paid to a secret pre-Manhattan (nuclear weapons) military project at the "Bomb Plant Complex".

EPA response: The San Bernardino Engineering Depot (Camp Ono) was an operation of the Corps of Engineers and the Quartermaster Corps during WWII on land leased from private parties. EPA has no credible evidence that any secret research went on there. All the wells in the area show the same low levels of naturally occurring radiation, including wells several miles upgradient of the depot and in portions of the basin hydrologically isolated from any potential influence from the depot.

13) The commenter is concerned that the groundwater had been contaminated and people were exposed to hazardous chemicals for 30 to 40 years because the bomb plant complex was kept secret.

EPA response: State and local water supply agencies responded immediately when the groundwater contamination (by VOCs) was discovered as part of a statewide Department of Health Services initiative to test groundwater for unexpected solvents. The state's investigation at that time discovered contamination in a number of other basins unrelated to military bases. See previous responses concerning past exposures (Comment #5) and evidence of military operations (Comments #9, 11 and 12).

John Stevens

14) The commenter feels that EPA has not taken radioactive contamination seriously, since the Newmark Superfund Site contamination seems like the same problem as Norton Air Force Base which does have radiation problems and chlorinated solvents together.

EPA response: (See response to Comments #11 and 12 above)

15) The commenter expresses doubt and frustration that the VOC contaminant levels reported in the EPA Remedial Investigation Report and related sampling reports are in parts per million rather than parts per billion. The commenter is concerned that the true concentrations are in parts per million and that these levels would cause problems with adequate treatment. The commenter reasons that EPA would not be proposing an action if the contaminants were really in the parts per billion since, "...then it wouldn't be a real problem."

EPA response: All EPA documents show that the contaminant levels of VOCs at the Newmark Superfund Site have been in the microgram per liter (parts per billion) range. Drinking water standards for both PCE and TCE are 5 micrograms per liter (parts per billion). EPA is concerned about contamination at this level and is responding to this release in order to meet the drinking water standards.

16) The commenter insists that more effort needs to be expended on explaining what was really going on at the 2700 acre complex at Camp Ono. He suggests that uranium tetrachloride was produced at the base, and that the nearby Ethyl Corporation was involved in producing tetrachlorides and ethylene as well as deuterium needed for nuclear activities.

EPA response: EPA is conducting a thorough subsurface investigation in the Camp Ono area. EPA is continuing to work with the Department of Defense to provide a more detailed account of activities at the former depot. The history of the San Bernardino Engineering Depot is available in the Administrative Record. The Army leased 1600 acres and all leases ended by 1947. See previous responses concerning radioactivity (Comment #12) and involvement of other facilities in the area (Comment #11).

Exhibit 95

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Exhibit 96

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Exhibit 97

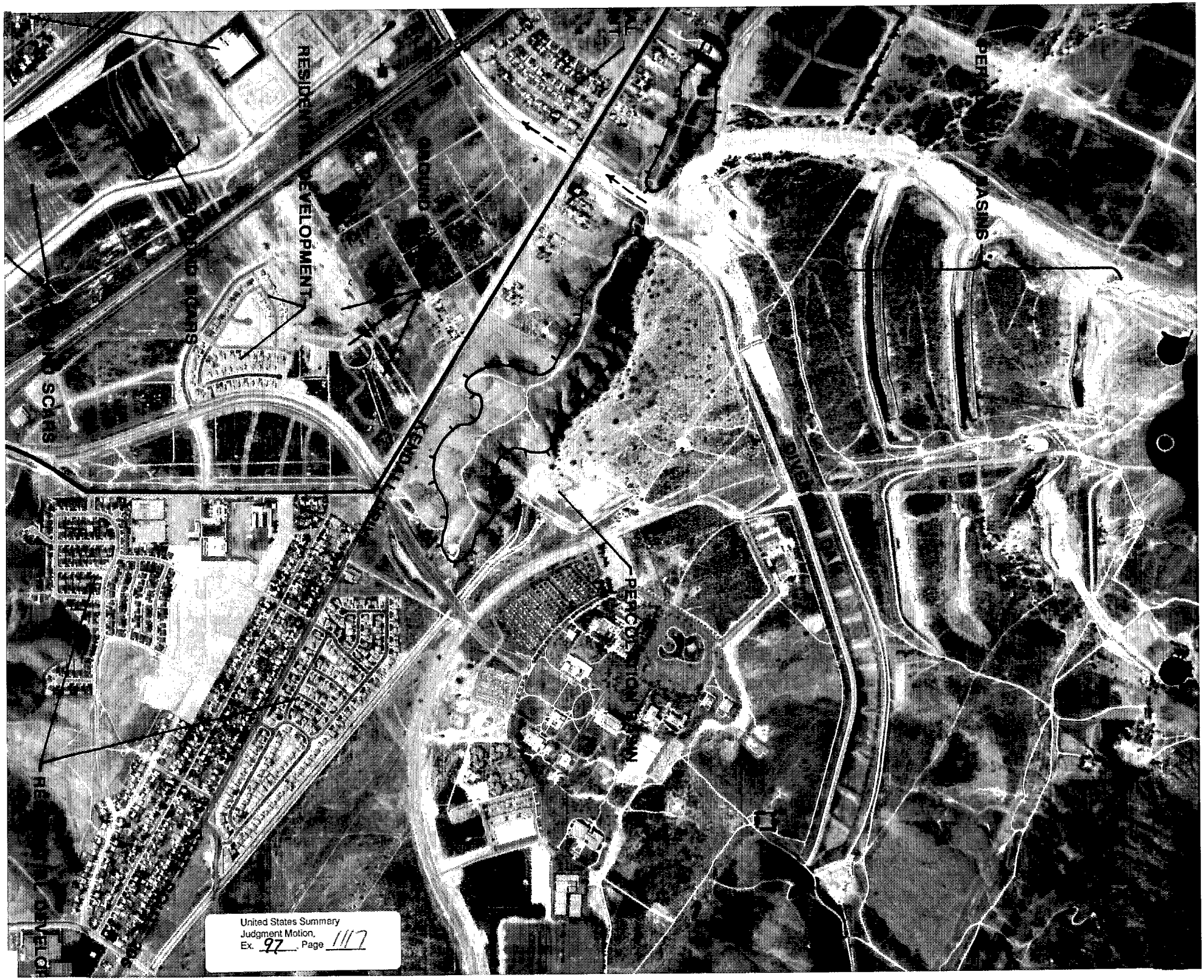

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Exhibit 98

IN THE UNITED STATES DISTRICT COURT

FOR THE CENTRAL DISTRICT OF CALIFORNIA

STATE OF CALIFORNIA, on behalf of the CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL, Plaintiff, vs. UNITED STATES OF AMERICA, DEPARTMENT OF THE ARMY, and DOES 1 - 100, inclusive, Defendants.	No. CV96-5205MRP(VAPx) No. CV96-8867MRP(VAPx) (Consolidated)
CITY OF SAN BERNARDINO MUNICIPAL WATER DEPARTMENT, Plaintiff, vs. UNITED STATES OF AMERICA, DEPARTMENT OF THE ARMY, and DOES 1 - 100, inclusive, Defendants.	

THURSDAY, JUNE 17, 1999

2:00 P.M.

---oOo---

DEPOSITION OF

CHESTER E. ANDERSON

VOLUME I

---oOo---

REPORTED BY: Nancy June Farley, Certified Electronic Court Reporter
Video/Audio Recording Services, Inc. - (916) 448-2457

COUNSEL

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EXHIBITS

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Exhibit 700 3
May 27, 1999 letter from Lewis M. Barr to Chester E. Anderson
Exhibit 701 70
Document dated March 23, 1978 from C.E. Anderson to Herbert B. Wessel
Exhibit 702 73
Document from Mark Bartson to Chet Anderson dated January 26, 1982
Exhibit 703 74
October 11, 1982 letter from Henry R. Stoner on Koppers Chemicals and Coatings letterhead to Chet Anderson with attachments
Exhibit 704 76
January 13, 1983 memorandum from Joe Como to John Gaston with attachment
Exhibit 705 78
Memorandum dated May 16, 1983, from K.W. Campbell
Exhibit 706 81
November 21, 1984 memorandum from Jeff Stone to C.E. Anderson with attachment
Exhibit 707 85
Coal Tar Tank Coating Data Sheet

BE IT REMEMBERED that pursuant to Notice and on Thursday, the 17th day of June, 1999, commencing at the hour of 2:05 o'clock in the afternoon thereof, at the offices of the U.S. Attorney, 501 I Street, Suite 10-100, Sacramento, California, before me, Nancy June Farley, a Certified Electronic Court Reporter and Notary Public for the State of California, there personally appeared

CHESTER E. ANDERSON

called as a witness by the defendant, who, being by me first duly sworn, was thereupon examined and interrogated as hereinafter set forth.

—o0o—

LEWIS M. BARR, Esq., of the Environments and Natural Resources Division, Environmental Defense Section, 601 D Street, N.W., Room 8130, Washington, D.C., appeared as counsel on behalf of the defendant United States of America.

LISA H. CLAY, Esq., of U.S. Army Corps of Engineers, 1325 J Street, Sacramento, California, appeared as counsel on behalf of the defendant Department of the Army.

ANN RUSHTON, Esq., of the Department of Justice, State of California, 300 South Spring Street, Suite 500, Los Angeles, California, appeared on behalf of plaintiff State of California.

THOMAS N. JACOBSON, Esq., of Gresham, Savage, Nolan & Tilden, LLP, 600 N. Arrowhead Avenue, Suite 300, San Bernardino, California, appeared on behalf of plaintiff City of San Bernardino Municipal Water Department.

—o0o—

DEPOSITION OF

CHESTER E. ANDERSON, called as a witness by the defendant who, being first duly sworn by the Certified Electronic Court Reporter, a Notary Public for the State of California, to tell the truth, the whole truth, and nothing but the truth, testified as follows:

EXAMINATION

By LEWIS M. BARR, Esq., counsel on behalf of the defendant:

Q Good afternoon, Mr. Anderson. Before we got started, we all introduced ourselves.

Would you state your home address and telephone number, please, for the record.

A It's 10860, Mendocino, California 95460. And my telephone number is 707-937-2263.

Q We're here pursuant to notice and subpoena.

And do you recall being – receiving a subpoena in this case?

A Yes.

Q And have you brought that subpoena with you?

A Yes.

Q Let me show you a copy – have the Court Reporter mark

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1 as -- we'll mark this as -- we're going to start with number
2 600.
3 MR. JACOBSON: We've already done that. We
4 skipped in a deposition, because of the --
5 MR. BARR: Off the record.
6 MR. JACOBSON: We did skip to --
7 THE RECORDER: Off the record.
8 (Off the record)
9 MR. BARR: Yeah. We'll start with the number 700.
10 And this is a May 27, 1999 letter from Lewis M. Barr to
11 Chester E. Anderson with a two-page subpoena attached.
12 BY MR. BARR:
13 Q Let me place in front -- give -- hand this back to you.
14 Mr. Anderson, do you recall receiving this letter?
15 A Yes, I do.
16 Q And the subpoena that's attached in this Exhibit 700
17 was enclosed.
18 A Yes.
19 Q All right. Just as a formality, I'm going to hand you
20 Form OBD3. If you fill it out and return it to the U.S.
21 Attorney's Office it entitles you to reimbursement of cer-
22 tain expenses.
23 A Okay.
24 MR. JACOBSON: Oh, excuse me.
25 MR. BARR: And --

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1 MS. RUSHTON: We'll have to go off the record for
2 a minute.
3 MR. BARR: -- witness fee.
4 MR. JACOBSON: Off the record.
5 (Off the record)
6 THE WITNESS: You want -- is this mine, or for
7 you?
8 BY MR. BARR:
9 Q Oh, you keep it in front of you for the time being.
10 A Okay.
11 Q Mr. Anderson, just, you know, sort of the rules of the
12 road.
13 Let me ask: Have you ever had your deposition taken
14 before?
15 A Yes, I have.
16 Q Okay. As you probably know, there'll be a number of
17 documents that will be marked as exhibits. Keep those in
18 front of you. They'll be collected at the end of the depo-
19 sition.
20 When a transcript is prepared for you to review, copies
21 of the exhibits will be provided, along with the transcript.
22 A Okay.
23 Q Any objections you may hear during the course of the
24 deposition are for the record. The judge will figure it out
25 later and rule on the objections. Once the objection is

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1 finished, you can go ahead and answer to the best of your
2 ability.
3 Do you understand that while this is an informal set-
4 ting, the oath you took is the same as if you were in front
5 of a judge and jury?
6 A Yes.
7 Q Okay. If you don't understand a word or phrase that I
8 use or if you find a question that I ask unclear, please let
9 me know, and I'll do the best I can to clarify it.
10 It will help if you allow me to finish my question
11 before starting your answer. It helps insure a clear tran-
12 script.
13 Please respond with spoken answers instead of nodding
14 or shaking your head since there may be an ambiguity created
15 by a gesture.
16 Mr. Anderson, have you done anything by way of prepar-
17 ation for today's deposition?
18 A Nothing.
19 Q Have you had any discussions with anyone regarding the
20 subjects that might come up at this deposition?
21 A Yes.
22 Q With whom have you had --
23 A I spoke to Norman Knoll, who's a counsel -- house
24 counsel for the Department of Health Services, Drinking
25 Water Environmental Management.

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1 Q How do you spell "Knoll"? Is it N-o --
2 A K-n-o-l-l.
3 I spoke to Ann Rushton. I have spoken to both Bill
4 Gedney and Jeffrey Stone totally -- nothing relative to this
5 situation. They're both good friends, and we speak quite
6 often about personal and business matters. And I think
7 that's the extent of any contact, other than to tell some-
8 body that I was giving a deposition.
9 Q Okay. Have you -- other than speaking to Ms. Rushton,
10 have you had any meetings with Ms. Rushton?
11 A No, I haven't.
12 Q Were your conversations over the telephone?
13 A Yes.
14 Q Was it one or more conversations?
15 A One.
16 Q Approximately how long was that conversation?
17 A I would roughly guess 10 minutes.
18 Q And have you ever met Mr. Jacobson before today?
19 A Yes, I have.
20 Q And on what occasions have you met him?
21 A On many occasions of conviviality at our Kiwanis Club
22 meeting where we were mutual members. But not -- I might
23 say not for the last seven years, at least.
24 Q On the subpoena that we've marked -- I'm going to hand
25 you back the original that you received. On the subpoena it

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1 requests that if you have any documents relating to reser-
2 voir or water tank coatings or to volatile organic chemicals
3 and potable water supplies or ground water, that you produce
4 them today.
5 Do you have any such documents?
6 A I -- clarifying that I read that in the context of -- I
7 mean, I have literature. I have reference materials inci-
8 dental on the subject of volatile organic chemicals as, you
9 know, I deal with that issue occasionally. And I have --
10 you know, I have -- the drinking water standards of the
11 State of California, which has standards. But nothing rela-
12 tive to this case that I would guess is anywhere related.
13 Q To clarify, do you have anything relating to interior
14 tank coatings?
15 A I don't think I have anything. I don't -- I have very
16 few files or files that I carried with me from previous
17 employment.
18 Q Okay. Are you aware that there have been several
19 depositions in this case so far?
20 A Yes.
21 Q Have you read or reviewed any parts of any transcripts
22 from those depositions?
23 A No.
24 Q Has anyone described to you what any of the testimony
25 was in any prior deposition?

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1 A No.
2 Q Mr. Anderson, would you state your date of birth,
3 please.
4 A August 31st, 1938.
5 Q And where were you born?
6 A Hot Springs, South Dakota.
7 Q And would you please describe your education after high
8 school and the degrees that you hold.
9 A I attended the South Dakota School of Mines and
10 Technology, and I have a -- for four years. And I have a
11 bachelor of science in civil engineering.
12 Q When did you receive your bachelor of science degree?
13 A June 1960. June 3rd, 1960.
14 Q Well, that's impressive. You got your bachelor of
15 science degree in civil engineering.
16 Was there a minor area of concentration?
17 A Yes. I was in public health engineering, and it was
18 not a -- it was an informal minor, if you will.
19 Q And are you currently employed?
20 A I am self-employed part-time as a consultant.
21 Q In what areas do you do consultant work?
22 A Drinking water quality primarily related to regulatory
23 and legislative activities.
24 Q Can you explain what that means regarding regulatory
25 and legislative activities.

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1 A Well, because I -- my career was focused in working as
2 a regulator, and I wrote many regulations and enforced them,
3 that I have unique qualifications to understand and inter-
4 pret what the requirements of the state and federal agencies
5 are for water supply agencies.
6 Q And can you give us some examples of people for whom
7 you've done consulting work.
8 A Yeah. I can give you -- there's only three, I
9 think. So my primary client is my former -- most recently
10 former employer, Metropolitan Water District of Southern
11 California. I have also done work for the Crestline-Lake
12 Arrowhead Water Agency, and for the High Desert Water
13 District, and for a legal firm in Reno. I can't remember
14 the name of it.
15 Q That's Reno, Nevada?
16 A Yeah. It's a very small item.
17 Q Before you undertook your consulting work, what did you
18 do for a living?
19 A The prior five years, I was employed by the Metro-
20 politan Water District of Southern California.
21 Q When did you become a consultant? I'm sorry.
22 A January 1st, 1998.
23 Q And for the five years prior to that, you were with the
24 Metropolitan Water District of Southern California.
25 A Yes. Five years and three months.

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1 Q And what position did you hold with Metropolitan Water
2 District?
3 A I was the -- I was a -- I can't remember my title
4 anymore. I was the head of the regulatory and legislative
5 affairs group within the water quality division of Metro-
6 politan.
7 Q Before you worked for Metropolitan Water District of
8 Southern California, where did you work?
9 A I worked for the California Department of Health
10 Services in their drinking water program, which, as you
11 probably know from looking at documents, has had about seven
12 different names. And I worked for them starting on June
13 20th, 1960 through, I think, October 2nd of 1992. Minus two
14 years of active military duty, in which I was on military
15 leave with the Corps of Engineers.
16 Q What kind of work did you do with the Corps of
17 Engineers?
18 A I was on active duty. I was the commanding officer of
19 an engineering company that was a support company for a
20 construction battalion.
21 Q Do you recall what years you were with the corps?
22 A Well, I was commissioned on June 3rd, 1960. But on
23 active duty was, I think, February 15th, 1961, to February
24 14th, 1963, or thereabouts. And then I was on active and
25 inactive reserve for a few years.

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1 Q What positions did you hold while you were with the
2 California Department of Health Services?
3 A I started as a junior civil engineer and moved through
4 the different engineering grades of the system to associate.
5 There's a couple different names in there -- senior. And my
6 final classification was a supervising sanitary engineer.
7 And my title was chief of the Southern California region.
8 Q During what period of time were you chief of the
9 Southern California region? Approximately.
10 A Approximately. In 1983 'til 1992.
11 Q And before 1983, what was your position?
12 A I was the district engineer in the San Bernardino
13 district office. And I started in that role about 1972, I
14 think.
15 Q Now, if I'm understanding what you've described so far
16 with the California Department of Health Services, it sounds
17 like it's broken down into districts, and within -- there
18 are a number of districts within various -- within a region,
19 and then there regions from the state as a whole.
20 A Yes.
21 Q Okay.
22 A And within the drinking water program, because every --
23 a lot of different components of health services are orga-
24 nized totally different. You know, child health services
25 may only have two offices, or something like that.

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1 This was the drinking water program.
2 Q Okay. It was the drinking water program. It had the
3 district and then regional --
4 A Right.
5 Q -- level of self care.
6 And from the chronology that you've given us so far, it
7 looks like you -- as soon as you finished your education in
8 June of 1960, you joined the California Department of Health
9 Services.
10 A Correct.
11 Q Okay. Does the California Department of Health
12 Services Drinking Water Division use particular identifying
13 numbers for each individual water system?
14 A They do now, and they have for a number of years. I
15 don't remember when that started. And the numbering has
16 been pretty consistent. It -- when it started, it was a
17 common prefix. San Bernardino, I think, is 36. It's alpha-
18 betical. And then there's a dash. And it then it used to
19 just be 001 up to about a hundred. But they changed that to
20 put some other digits in there to coincide with the federal
21 system, so --
22 Q Generally speaking, do you have a recollection as to
23 when that numbering system began?
24 A The original one or -- the original system or the
25 change to EPA system?

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1 Q Well, I'm thinking -- I guess the original one where --
2 you mentioned the 36.
3 A It was -- I'm -- I'd just be guessing that it was
4 probably in the '70s.
5 Q Okay.
6 A May have been -- it could even go back further, because
7 the county numbering system has been around for a long time.
8 Q Okay. Was there a particular reason that the water
9 systems were assigned their own numbers?
10 A Their own numbers or the wrong numbers?
11 Q Their own.
12 A Their own numbers.
13 Q I apologize.
14 A Well, yes.
15 Q How was -- let me ask this question this way: How were
16 the assigned numbers used?
17 A They were used to identify the system in -- you know,
18 in a great variety of ways. You know, they'd cross-
19 reference to water quality reports. It's almost -- any
20 possible way. And it's becoming even more so that the
21 number is probably more commonly used for all statistical
22 stuff than the system names, so --
23 Q Was it a filing system as well?
24 Was it used for filing purposes?
25 A To some degree. But we used to do a lot more with

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1 paper and paper files. And so they were -- you know, alpha-
2 betical by name system number was less relevant, I think,
3 during the early days.
4 Q Okay. Was the -- is the City of San Bernardino water
5 system within the San Bernardino district?
6 A Yes, it was. Was and is, I think.
7 Q Has that been true throughout the time you were with
8 the department?
9 A Yes.
10 Q I've seen the phrase "large community water system."
11 Is the San Bernardino water system classified by the
12 state as such a system?
13 A Yes.
14 Q Has that also been true throughout your time with the
15 department?
16 A Yes. Except that there is a difference, if I can
17 clarify that.
18 Q Uh-huh.
19 A Prior to 1975 or '74, when the -- for the first time,
20 there was a federal Safe Drinking Water Act. Prior to that
21 time, the drinking water systems were regulated only by the
22 state under state law and state authority. And California
23 statutes -- and I'll have to think -- at least operational-
24 ly, there was a separation of -- at 200 service connections.
25 And that any system that had 200 service connections or more

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1 was classified as considered a large water system.
2 Even if that terminology wasn't used in the law, that
3 was the commonly used terminology. And all of those systems
4 were regulated by the state. The small water systems were
5 less than 200 and were regulated by the county.
6 In 1975, the EPA passed – or the Congress passed the
7 federal Safe Drinking Water Act, and the established defini-
8 tions of community water systems – there had never been
9 such a definition. Noncommunity water systems. And large
10 and small still were not defined.
11 They started getting used and defined in different ways
12 by EPA primarily. And it's changed, and it's changed for
13 different regulations. Sometimes 10,000 people, sometimes
14 10,000 service connections, sometimes a thousand.
15 California's law changed in about 1990 – roughly '89.
16 And all of the water systems were put under the state juris-
17 diction, including those less than 200 services.
18 So the terms "large" and "small" are not really too
19 well defined, and they are used in – with mixed reference
20 in state and federal regulatory statute.
21 Q I understand.
22 Service connections. Is that essentially customers?
23 In other words, saying –
24 A That's like a meter to a house or a meter to a busi-
25 ness.

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1 Q Okay.
2 A As opposed to individual persons.
3 Q Are you familiar with the use of the term "purveyor" to
4 describe utilities that supply water?
5 A Yes.
6 Q In the early 1980s, did you become aware that – of
7 findings that volatile organic chemicals were leaching from
8 reservoir interior tank coatings into the water in those
9 reservoirs?
10 A I would say – the early 1980s would be as close as I
11 could probably pinpoint that, yeah. Yes.
12 Q Do you recall which volatile organic chemicals were
13 coming up in the tests?
14 A I – trichloroethylene and perchloroethylene, although
15 I can't remember which was more predominant. There was one
16 of those more predominant. Xylene and toluene. And then
17 there occasionally would be some small amount of some
18 slightly different volatile organic.
19 Q Do you recall chloroform appearing in some of the
20 detections?
21 A There were chloroform findings. I actually do not
22 recall in connection with tank coatings specifically.
23 Q The issue as it developed in the 1980s was this issue
24 localized to a particular part of California, or was this
25 problem occurring statewide?

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1 A Only by – I am not familiar with all of the – what
2 was happening statewide. But, you know, we did hear about
3 other places that had situations where there were findings
4 of volatiles from tank coatings.
5 Q Were you – in the course of your work as a district
6 engineer in the San Bernardino district, were you in regular
7 contact with the heads of other districts within the state?
8 A Yes.
9 Q And was there, in general, sort of this interchange of
10 information regarding the tank coating problem?
11 A Yes.
12 Q Do you recall the extent to which you had contacts with
13 personnel within the City of San Bernardino concerning the
14 tank coating problem?
15 A Within the City of San Bernardino water department?
16 Q Right. You know, personnel within that organization.
17 A I had very frequent contacts with the City of San
18 Bernardino water department personnel on many issues.
19 Q Okay.
20 A But I cannot recall clearly any specific contact spe-
21 cifically about tank coatings.
22 Q Okay.
23 A Not that it didn't happen.
24 Q I understand.
25 Was the issue of the nature that you would likely have

Page

1 discussed it with San Bernardino personnel?
2 A It's very possible. And certainly people on my staff
3 would have been talking to the City of San Bernardino water
4 department, just as they would have been talking to a great
5 number of others, but not all. And the difference being
6 those who were either installing a new tank or rehabilitat-
7 ing a tank.
8 Q When you say members of your staff, who would have had
9 contacts with San Bernardino personnel?
10 A Well – what time period?
11 Q This would be in the first half – you know, the first
12 half of the 1980s. Let's say 1980 to 1985.
13 A Bill Gedney, definitely. Jeff Stone, possibly. I'd be
14 less certain about Jeff in that time period. Diana Barich.
15 She started in that office, I think, in the – in July of
16 '85, and she became the district engineer at that time. So
17 she would have had contacts, possibly. Again, I don't know
18 specifically.
19 And I can't remember. I – there was a – I don't
20 think there was an earlier staff person who would have been
21 involved.
22 Q Can you recall the names of City of San Bernardino
23 personnel with whom your staff would have been in contact?
24 A Well, generically. Herb Wessel was the general
25 manager. Joe Stejskal was their lead operations engineer.

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1 Q Is that S-t-e-j-s-k-a-l?
2 A I think so.
3 In that time period, Mike Lowe was somebody who might
4 have contact with. There might have been some others, but I
5 don't --
6 Q Does -- do you recall the name Joseph Bocanegra?
7 A Oh, yes. Joe Bocanegra.
8 Q Is he someone that your staff would have had fairly
9 frequent contact with?
10 A If he was with the city in that time period. When he
11 was with the city, the staff would have had frequent contact
12 with him.
13 Q Did you ever have any contact with the city personnel
14 on these tank coating issues that we've mentioned?
15 A I answered that, I think. I told you I did not recall
16 any specific conversation. It's very possible I could have
17 had at some time, or been in a meeting when it came up, or -
18 - I remember the -- where there were real problems that
19 stood out. There are some of those I remember. And they
20 weren't with the City of San Bernardino.
21 Q Okay. Now, as I understand it, contaminants in water
22 are often measured in terms of parts per billion, or ppb; is
23 that right?
24 A That's sort of correct. The correct term is micrograms
25 per liter.

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1 Q Is that that little U --
2 A Right.
3 Q -- with a G --
4 A Right.
5 Q -- per liter?
6 A Right.
7 Q Are the two terms -- "ppb" and "micrograms per liter" -
8 - used synonymously?
9 A Yes.
10 Q Are you familiar with the existence of what were called
11 action levels for various contaminants in drinking water?
12 A Yes.
13 Q Did the State of California establish action levels for
14 a number of different volatile organic chemicals?
15 A They did, and do.
16 Q Did the term "action level" change into something else
17 eventually?
18 A The term didn't. The term has been used to essentially
19 mean the same thing that it meant in the '70s as it means
20 today.
21 Q Okay. Is there a different term that's come into use
22 for these contaminant levels in water? I guess the one I'm
23 thinking of is maximum concentration level.
24 A No. Maximum contaminant level, MCL. But --
25 Q How is that different from an action level?

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1 A An action level is an advisory. An MCL is a regula-
2 tion, is a law.
3 And the term "MCL" actually, I think, came into vogue
4 or official use with the federal Safe Drinking Water Act.
5 We used to refer to things as primary drinking water stan-
6 dards. And the number -- that was the standard. And we had
7 primary drinking water standards at the -- and we -- we've
8 always had those at the same time we had action levels. And
9 we still do have action levels and MCLs now.
10 Q Okay.
11 A We, the state, federal government.
12 Q How did the State Department of Health Services become
13 aware that there was an issue concerning volatile organic
14 chemicals leaching from reservoir interior tank coatings
15 back in the early '80s?
16 A How did the department become aware?
17 Q How did the issue arise? I don't know if that's the
18 best way to phrase the question. But we're trying to get a
19 sense of how this came to everyone's attention.
20 A Well, my -- from my personal experience, it was because
21 there was an occasion when there was a taste and odor prob-
22 lem that was related back to a tank that had recently been
23 coated. And then subsequently, there were analyses. I
24 don't recall precisely, you know, where this was first
25 discovered or, you know, who made that first observation.

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1 It was kind of a --
2 Q Do you recall there being a study or an analysis of
3 groundwater in the San Bernardino area in water that was
4 taken from the Bunker Hill Basin?
5 A Yes.
6 Q And what do you recall about that study?
7 A Well, in 1980, if my memory serves me, that there were
8 detections of trichloroethylene primarily, I believe, in
9 Northern California and in the San Diego Basin in Southern
10 California. And one result of that was a decision by the
11 department to do a study we refer to as the four-basin
12 study. And the Bunker Hill Basin was selected as a basin
13 that was not heavily industrialized like San Gabriel or the
14 area, but had had urbanization.
15 So it was selected as -- and the reason it was selected
16 is because one of my former staffers then worked in Berkeley
17 and was very familiar with the basin and recognized that it
18 would be a good object of this particular study they were
19 doing.
20 Q And who was that, that --
21 A Steve Nelson.
22 Q Was Mr. Nelson primarily responsible for undertaking
23 the four-basin study?
24 A For -- he was responsible for -- really, for organizing
25 it and coordinating it. The districts -- district offices

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1 actually implemented and did the monitoring, did the sam-
2 pling and that kind of thing. He did the report.
3 Q Before the early 1980s, can you recall any other
4 information that came to the state's attention concerning
5 reservoir tank coatings and PCE or TCE contamination?
6 A No.
7 Q Do you recall at some point in the -- well, just say
8 the last 30 years, the technology developed sufficiently to
9 be able to detect VOCs in water?
10 A Yes.
11 Q Do you recall approximately when that technology devel-
12 oped to that level?
13 A I really -- I couldn't give you any accurate assessment
14 of that.
15 Q Okay. When the problem came to your attention as far
16 as reservoir tank coatings and PCE and TCE in the water, can
17 you describe in general terms how the Department of Health
18 Services went about gathering information concerning the
19 issue, aside from conducting groundwater testing.
20 A Well, I -- could you rephrase the question? I -- or
21 repeat, I mean. I don't mean rephrase it.
22 Q I can try it again.
23 Did the Department of Health Services undertake an
24 inquiry into the nature of the reservoir tank coating
25 problem, other than conducting groundwater sampling and

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1 analysis?
2 A Well, I can't answer your compound question, if you
3 will, because the two are not linked in any way.
4 Q Okay.
5 A I mean, in my recollection, there wasn't any relation-
6 ship between the two.
7 Q Between two.
8 What are the two things?
9 A Between any finding in groundwater and the tank coat-
10 ing.
11 Q Okay.
12 A I mean, the one -- we talked about how the groundwater
13 problem was discovered, and it became known as -- that a
14 widespread -- I mean, it wasn't. That was one basin.
15 Widespread groundwater contamination problems in different
16 places in California.
17 And then we had -- there was a discovery, if you will,
18 or a -- found out that we had some tank coating related
19 volatile organic problems very selectively and specifically
20 related to a tank here, a tank there. But there was no
21 nexus, as far as I know.
22 Q Did you ever inquire -- did you ever investigate as to
23 whether there might be a connection between the contamina-
24 tion in the reservoir tanks and contamination in the ground
25 water?

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1 A No.
2 Q Do you know of anyone within the state who did under-
3 take such an inquiry?
4 A No.
5 Q Are you aware of any reason why that was never done?
6 A Because -- I can only speak for my own experience. And
7 in my area of responsibility, there was no -- didn't occur
8 to me, there was no basis, and then in looking back, I still
9 see no reason why we would have done that.
10 Q In the course of looking into the question of reservoir
11 coatings and PCE or TCE contamination in the water, did you
12 determine how long the PCE or TCE had been used in the
13 reservoir coatings?
14 A How long it had been used prior to the time that we
15 first detected a problem?
16 Q Yes.
17 A There was no study or analysis. I had discussions with
18 tank coating manufacturers and corrosion experts. But I
19 don't even recall specifically the results of those discus-
20 sions, other than it had been done for awhile and it was
21 common practice at the time.
22 Q It had been done for awhile prior to the early 1980s?
23 I'm just trying to understand what you --
24 A Yeah. Prior to the time that we first determined that
25 there was a problem and that -- relative to tank coatings

Page

1 and volatile organics in the reservoir -- in the water in
2 the reservoirs.
3 Q I think you indicated that to the best of your knowl-
4 edge, no one in the state examined any possible connection
5 between TCE and PCE contamination in reservoir water and
6 contamination with the same chemicals in groundwater; is
7 that a fair statement?
8 A I think so.
9 Q Are you aware of any other state which undertook such
10 an inquiry?
11 A No.
12 Q Did you become familiar during this time period in the
13 early 1980s of the different kinds of materials that were
14 used to coat the insides of water reservoirs?
15 A Yes.
16 Q And how did you become -- how did you gather that
17 information?
18 A How did I gather that information? Well, literature,
19 reviews, discussions with tank coating people, with water
20 suppliers who had different experiences, pros and experts.
21 Q When you say tank coating people, do you mean tank
22 coating contractors?
23 A Both contractors and manufacturers or suppliers. You
24 know, they -- people like Koppers Chemical and -- I can't
25 even remember the name anymore -- Tnemec?

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1 Q Is that Tnemec?
2 A Yeah. And there's -- I remember those names. I don't
3 remember specific contacts or people, but --
4 Q Right. Tnemec is "cement" spelled backwards, as I
5 understand it.
6 A It is. I'm glad I learned something today.
7 Q Do you recall the company called Engard?
8 A I've heard the name.
9 Q Do you recall if they made interior tank coating mate-
10 rial?
11 A I don't recall specifically.
12 Q Did you become familiar with the fact that there were
13 different kinds of interior coating systems?
14 A Yes.
15 Q Did you learn that there were cold-applied coal tar
16 systems?
17 A Yes.
18 Q And did you also learn that there were some hot-applied
19 coal tar --
20 A Yes.
21 Q -- systems?
22 Do you recall another word or term for the cold-applied
23 coal tar coatings?
24 A No.
25 Q Do you recall the term "cutback solvent"?

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1 A I've heard that term. I don't actually remember it
2 being used in this contact.
3 Q Okay. I may have asked you this a slightly different
4 way, but at the risk of repeating myself: In the course of
5 this investigation or this inquiry into the reservoir tank
6 coatings issue, did you determine, or do you recall learning
7 when the cold-applied coal tar coatings were first commer-
8 cially available?
9 A No.
10 Q Did you come to understand that PCE or perchloroethyl-
11 ene was one of the chemicals that was used in connection
12 with the cold-applied coal tar coatings?
13 A Actually, I -- TCE and PCE almost get run together
14 in my mind. And the -- sometimes they'd show up, not
15 necessarily in a tank coating context, but in, you know,
16 groundwater -- whatever. But frequently, you'd see them
17 both. Sometimes one would be much more predominant and/or
18 only alone there. And I frankly don't recall in the coat-
19 ings which of the two, or if both were a factor.
20 Q Do you know if the cold-applied coal tar coatings were
21 used by any water utilities on portions of the water system
22 other than the tank interiors?
23 A There were some -- and I don't know whether they were
24 hot- or cold-applied coatings that were used on some pipe-
25 lines. Or some bitumastic-type coatings that were used.

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1 Q On the pipelines.
2 A Right.
3 Q Okay. Do you know if it was -- do you recall if it was
4 any easier or more convenient for someone to use a cold-
5 applied as opposed to a hot-applied?
6 A I don't recall. Wasn't involved in a lot of the nitty-
7 gritty on those.
8 Q Oh, okay. All right. As far as the details on appli-
9 cation procedures and removal of old, you know, existing
10 tank coating systems, was there someone who was more
11 involved in the nitty-gritty understanding of the issue
12 within your department?
13 A There probably were individuals that maybe worked with
14 it more closely than I did. But I can't -- don't know
15 anybody by name.
16 Q Was Bill Gedney more involved on the details, do you
17 think?
18 A He probably was on an occasional project, because he
19 was a staff engineer, and I was off attending meetings or
20 something.
21 Q The -- as far as your contacts or contacts of your
22 subordinates among tank coating contractors, do you recall
23 the names of anyone in particular, either a company name or
24 an individual name?
25 A I don't recall offhand any name.

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1 Q Okay.
2 A With -- what'd you say, with tank coating contractors?
3 Q Right.
4 A No.
5 Q In terms of corrosion engineers, do you recall the name
6 of anyone who was helpful in providing information on this
7 subject?
8 A Yeah.
9 Q Who was that?
10 A Bill Harper.
11 Q Other than Mr. Harper, do you recall anyone else who
12 helped you or your subordinates develop information?
13 A Not specifically.
14 Q With respect to coating manufacturers, do you recall
15 the names of any individuals with any of the --
16 A No.
17 Q -- manufacturers?
18 Do you -- is it your recollection that there were
19 contacts with Koppers representatives?
20 A Fairly minimal, and sometimes third-hand. I mean, on -
21 - not -- the department wasn't talking to them, but the
22 water utility was. We may see something indirect -- you
23 know, some document or something like that from the manufac-
24 turer.
25 Q And what about Tnemec? Do you recall particular

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1 contacts with --
2 A No.
3 Q -- them?
4 Same question as to Engard.
5 A The answer is the same, yeah.
6 Q Okay.
7 A I didn't know whether to say "yes" or "no."
8 Q Okay.
9 A Same answer.
10 Q Is it your recollection that there were files kept by
11 the Department of Health Services concerning tank coating
12 problem and TCE and/or PCE?
13 A Yes.
14 Q Were these developed during the course of the early
15 1980s, at least in part?
16 A The department kept records on everything, so -- I
17 mean, I don't know how to answer that question.
18 Yes. We kept records on any situation, to some degree.
19 That conversations or lab analysis incidents.
20 Q Was the general practice to make documentary records of
21 these matters as they came up and as they developed?
22 A Yes, in general.
23 Q Okay. What I'd like to do initially is ask you to
24 review -- and I'll have some specific questions on some
25 exhibits that have been marked in the previous depositions.

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1 Let me first ask you to -- if you'd briefly -- what was
2 previously marked as Exhibit 505 in this case.
3 A What do you want me to --
4 Q Well, I mean, if you'd just glance over this. I'll
5 just have a couple of questions.
6 A Okay.
7 Q If you need -- if you feel the need to read it in more
8 detail, please let me know.
9 A That probably depends on what question you ask.
10 Q All right. Why don't we start there --
11 A Okay.
12 Q -- and see what we need to do.
13 Do you recall receiving technical data sheets for tank
14 coating products --
15 A Yes.
16 Q -- in the course of the early 1980s?
17 A Yeah. Since that's my writing -- handwriting on the
18 corner there, I'd better acknowledge that I received that.
19 Q All right.
20 A Yeah. No, I recall seeing this kind of a sheet.
21 Q Okay. And you were referring to the word "attachment,"
22 and there's a pound sign, "1."
23 A Right.
24 Q Okay. There is some underlining on various portions of
25 the document on page 2 -- page 1 and page 2 and page 4.

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1 Did you do that -- is that your underlining or --
2 A I don't --
3 Q -- can you tell?
4 A I don't recognize my underlining.
5 Q All right.
6 A I don't know.
7 Q What about the arrows on page 2?
8 A I don't know that either.
9 Q Okay. Is it your custom and habit to underline things
10 sometimes as you read them?
11 A Yes.
12 Q Okay. On the first page after -- there's the use of
13 the word "use" with a colon.
14 A Uh-huh.
15 Q Underneath that, there's a statement:
16 "Do not use for dead-ends, stagnant, or
17 very low flow lines."
18 A Yes.
19 Q And that's underlined.
20 Do you have any recollection as to why that warning was
21 put in there?
22 A No.
23 Q Would you please look at Exhibit 506 previously marked
24 as an exhibit in this case.
25 Does this look like -- does this look familiar to you

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1 as another technical data sheet?
2 A It doesn't look that familiar, except for the handwrit-
3 ing.
4 Q Do you recall whose handwriting that is?
5 A That's mine.
6 Q At the top, it reads:
7 "Received from Joe Bocanegra at SB
8 City."
9 A Yes.
10 Q Is that the Mr. Bocanegra we mentioned earlier?
11 A Yes.
12 Q And underneath that, on the right side in the corner
13 there, it says:
14 "Contains PCE."
15 A Right.
16 Q Is that also your handwriting?
17 A Right.
18 Q If I could ask you, please, to review what's previously
19 been marked as Exhibit 507. And I'll ask you if I recognize
20 that document.
21 A I do.
22 Q What is it?
23 A It's a report on the four-basin study that I referred
24 to earlier by Stephen Nelson, who was the primary author.
25 Q Okay.

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1 THE RECORDER: Excuse me. Are you saying "four-
2 basin" or "full-basin"?
3 THE WITNESS: F-o-u-r.
4 THE RECORDER: Thank you.
5 BY MR. BARR:
6 Q And the next exhibit, Exhibit 509 previously marked in
7 this case.
8 A Yes.
9 Q Do you recall -- the memorandum is from M.J. Bartson to
10 C.E. Anderson.
11 My first question is: Is the C.E. Anderson you?
12 A Yes.
13 Q Do you recall receiving this memorandum from Mr.
14 Bartson?
15 A Not specifically. But obviously I did.
16 Q Okay. There is a handwritten notation, "TCE/PCE study"
17 in the upper right corner.
18 A Yes.
19 Q Do you know whose handwriting that is?
20 A Yes.
21 Q Whose is it?
22 A That's mine.
23 Q And who was Mr. Bartson was the -- as of August,
24 September 1981?
25 A He was a fairly new staff engineer who I hired. Was

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1 working for me in the San Bernardino office.
2 Q Is this something that he would have prepared at your
3 request?
4 A Yes.
5 Q If you would turn to the last page of Exhibit 509. It
6 appears to be a diagram of some kind.
7 A Yes.
8 Q Can you shed any light on what this is a diagram of?
9 A Practically none. It's -- it appears to be a -- what
10 they call a node chart. And it's used in a hydrogeological
11 analysis of water flows or water assessments. But I don't
12 recognize that. I mean, I don't specifically know whether
13 or not I recognize that anyway.
14 Q When you say "a node chart," that's not a term I'm
15 familiar with.
16 What is a "node chart"?
17 A It's not a term I'm very familiar with either.
18 They just divide the basin up in what they call nodes.
19 They're really sectors. And then they have data from those
20 and try and assess the flow and direction and -- of ground-
21 water flows. Some of that voodoo groundwater hydrogeology
22 stuff.
23 Q Do you have any training or expertise in hydrogeology?
24 A I do not.
25 Q As your -- and when I say "your," I mean the work of

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1 your department -- progressed during the early 1980s on
2 trying to gain an understanding of the TCE PCE problem in
3 reservoir tank coatings, did you communicate with various
4 water purveyors to communicate what you had learned?
5 A Regarding tank coatings?
6 Q Yes.
7 A I think we did. I don't remember specifically. But I
8 think we -- I believe we sent out a general bulletin, you
9 know, to all suppliers that talked about this issue.
10 Q Let me ask you to look at what was previously marked as
11 Exhibit 513 in this case. And for the record, this is an
12 August 17, 1982 Department of Health Services memorandum to
13 all large community water systems from Sanitary Engineering
14 Branch, Berkeley, subject: Tank Coatings.
15 A Yes.
16 Q Do you recall having seen this document before today?
17 A Generally, I know I did. I just don't remember it
18 specifically.
19 Q Okay. Do you have any information as to whether or
20 not this was the first such memorandum from the Sanitary
21 Engineering Branch to water systems on this subject?
22 A I would -- I don't know that, actually, whether this
23 was the first broad distribution. And I don't know that it
24 was -- that there was not specific communications, you know,
25 from a specific district office to a specific water supplier

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1 or a specific district office to all of the water suppliers
2 in that district.
3 Q Is this the kind of general bulletin that you were
4 referring to earlier?
5 A Yes. I'd forgotten we'd done that. It was a good
6 idea.
7 Q Looking at page 3, the typed signature, if you will, is
8 for a John M. Gaston, Chief, Sanitary Engineering Branch.
9 Was he at a regional level or district level or some
10 other level?
11 A He was the top of the -- he was our statewide branch
12 chief. He was the head of the Sanitary Engineering Branch,
13 which was the drinking water program at that time.
14 Q Where it says under cc's, "SEB administrative staff,"
15 is that Sanitary Engineering Branch administrative staff?
16 A Yes.
17 Q Would you have been included in that category?
18 A Yes.
19 Q As I understand your prior testimony, you were a dis-
20 trict engineer at this point.
21 A Yes.
22 Q Underneath the cc for SEB administrative staff, there
23 is a cc indicated to H.F. Collins, Ph.D.
24 Do you recall who Dr. Collins was at this point?
25 A Yes.

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1 Q Who was he as of August 1982?
2 A He was -- and I don't recall his precise title. But he
3 was the next head of the -- I think there was a division at
4 that time. Environmental Health Division, I believe it was.
5 He was the chief of that division. John Gaston reported
6 directly to him.
7 Q And underneath that, there is a reference to Nate Lau,
8 L-a-u, EPA.
9 Do you know who that is, or was?
10 A I -- he worked for EPA. I think he worked in region 9
11 in San Francisco, but I'm not positive.
12 Q On the first page, there is a -- almost looks like a
13 received stamp. It says:
14 "Vector Biology and Control Section,
15 August 9, 1982, San Bernardino."
16 What does that stamp indicate?
17 A Probably August 19, or else we were predating our
18 incoming mail.
19 Q You're probably right.
20 A We shared -- the Sanitary Engineering Branch shared
21 office and a receptionist with the Vector Biology and
22 Control Section and -- I can't remember who else at the
23 time. And the receptionist used the wrong stamp to -- you
24 know, they tend to do that sometimes.
25 Q Is the reference to San Bernardino -- is that an

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1 indication that it was received by the San Bernardino dis-
2 trict?
3 A Yes. I would wager good money that that was what that
4 meant.
5 Q Okay. All right. Next exhibit I'd like you to review,
6 please, is Exhibit 514, previously marked in this case.
7 A I'll read this one.
8 Q While the witness is reading, I'll just state for the
9 record this is an August 19, 1982 memorandum from Chet
10 Anderson to SEB staff, subject: Info on Tank Codings.
11 A I thought I knew a lot about this.
12 Okay.
13 Q Do you recognize this as a memorandum that you wrote on
14 or about August 19, 1982?
15 A Yes.
16 Q And next to the State of California memorandum printing
17 in the upper left corner, you see some handwritten, looks
18 like, initials followed by a line with checkmarks.
19 Can you explain what that is.
20 A That's a -- we were -- had a coffee company, MBJ --
21 Mark, Bill, Jeff, my three staff engineers in the district.
22 And this is standard for circulating something for -- so
23 that everybody got a chance to look at it.
24 Q So this was your routing system.
25 A Right.

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1 Q Okay. Mark is the Mark Bartson that you mentioned
2 earlier.
3 A Bartson.
4 Q And Bill is Bill Gedney.
5 A Correct.
6 Q And the J is for Jeff Stone.
7 A Correct.
8 Q In the first paragraph, you stated that most of the
9 data was derived from discussions with Bill Harper, a PE
10 specializing in corrosion control and coating materials.
11 I take it that PE stands for professional engineer.
12 A Correct.
13 Q Do you recall any other sources that -- you indicate
14 most of the data was obtained from Mr. Harper.
15 Do you know if -- can you recall any other sources?
16 A I -- other than documents, like the attachments that I
17 might have received -- could have received them from the
18 water supplier, from Bill. In fact, they were -- like, the
19 reference from Joe Bocanegra. I got -- exchanged informa-
20 tion with water suppliers, met -- but Bill Harper is proba-
21 bly the most qualified water-related corrosion engineer that
22 I've known in my career, and he's extremely knowledgeable
23 and has always been extremely helpful because he's always
24 trained to do the right thing with -- in terms of getting
25 the right kind of system for his customers.

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1 So he was very helpful in terms of educating, you know,
2 engineers that were not water -- or not corrosion engineers
3 about a lot of these issues.
4 Q Was it your intent to be as accurate as you possibly
5 could be in preparing this memorandum to your staff?
6 A Yes.
7 Q On page 2, the first paragraph begins with the words,
8 "These coatings are."
9 A Yes.
10 Q The -- looks like the fourth sentence, beginning with
11 the words, "Since specifications do not limit."
12 Do you see that?
13 A Yes.
14 Q It says:
15 "Since specifications do not limit a
16 maximum thickness and because there is a
17 tendency with corrosion protection to
18 feel that 'more is better,' the coating
19 may be applied too thick in some areas."
20 Do you recall where you obtained that information?
21 A I would just refer back to the fact that I attributed
22 in the memo to receiving most of it from Bill and -- Harper.
23 Q Do you recall any particular instances where that
24 problem was exemplified?
25 A Not specifically.

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1 Q Do you recall it occurring fairly frequently?
2 A No. I really didn't have any way of -- we didn't make
3 inspections, we didn't inspect the tank coatings, we didn't
4 make the measurements. We probably heard some anecdotes
5 about this occurring occasionally or -- but I couldn't
6 quantify that.
7 Q Okay. Was it -- did you include it in this memorandum
8 because it was sufficiently common that the staff ought to
9 be on the lookout for something like that?
10 A I included it because it was a point of information.
11 I -- it's something that I felt was important that they know
12 or -- I guess. Sounds to me like it would have been impor-
13 tant to know that.
14 Q Okay. Turning, please, to page 3. There's a section
15 on the recommended procedures.
16 A Yeah.
17 Q Do you recall also receiving this information, or do
18 you assume you received this information from Mr. Harper?
19 A Yes. I assume that, because the memo says so.
20 Q All right. You see farther, about two-thirds of the
21 way down the page, it refers to -- in an item numbered 1, it
22 says:
23 "Thoroughly wash the interior with high-
24 pressure potable water to remove
25 residual solvents, dirt, dust, sand, et

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1 cetera."
2 A Yes.
3 Q And then item 2, it says:
4 "Thoroughly drain all of this washed
5 down water completely out of the tank."
6 And the word "all" is underlined.
7 A Yes.
8 Q Do you have a recollection as to why it was recommended
9 that all of the washed down water be completely taken out of
10 the tank?
11 A Well, if there were any residual solvents and if there
12 were dirt, dust, sand -- microorganisms, if you will -- you
13 know, contamination from workers, you did not want that
14 remaining in the tank when you filled it.
15 Q Do you have any recollection as to where the washed
16 down water was supposed to be discharged to?
17 A Not specifically.
18 Q Do you have a general recollection?
19 A I don't. I'd be guessing, either generally or specif-
20 ically.
21 Q Based on your experience with the Department of Health
22 Services, do you think you can make an educated guess as to
23 where that washed down water would have been discharged to?
24 A It would have either gone to the ground -- you know, to
25 the -- or to a drainage channel, of which there are many in

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1 Southern California particularly, concrete lined, or it
2 could have gone to the sewer system. Could have -- might
3 have gone to the street where it would have made its way to
4 a drainage channel.
5 Q So if I understand your summary, there's one of three
6 possibilities: To the ground, to the sewer system, or to
7 drainage channels.
8 A Right.
9 Q Next exhibit I'd like you to review, please, is what's
10 been marked as Exhibit 515.
11 While you're reviewing that, I'll state for the record
12 that this is an October 4, 1982 memorandum from Chet
13 Anderson to SEB staff.
14 A Okay.
15 Q Do you recall preparing this memorandum on or about
16 October 4, 1982?
17 A Only that I -- no, I don't recall preparing it. I know
18 that I did.
19 Q Is -- do you recognize the signature --
20 A Yes.
21 Q -- as yours?
22 A Yes.
23 Q Up above in the upper right-hand corner, there's some
24 printed words, "File: Tank Coatings."
25 Do you recognize that handwriting?

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1 A It's not mine. I don't know for sure whose it is.
2 Q Okay. In the first paragraph, it indicates:
3 "I have been advised that there are two
4 errors in technical references in my
5 8/19/82 memo on tank coatings as fol-
6 lows."
7 And then you describe them.
8 Do you recall by whom you were advised of these errors?
9 A No, I don't.
10 Q Do you know -- or do you have a sense as to whether it
11 would have been someone within the department or someone
12 outside of the department?
13 A It could have been either.
14 Q Is the 8/19/82 memo that's referenced in Exhibit 515
15 the document that was marked as Exhibit 514?
16 A I don't have those -- oh, I see. Okay.
17 Sorry. Would you ask that again? I was --
18 Q Yeah. Could you read the question back, please?
19 (The tape was replayed)
20 BY MR. BARR:
21 Q Directing your attention to Exhibit 515 on the cc's,
22 there is a carbon copy indication to Sam Kalichman.
23 A Correct.
24 Q K-a-l-i-c-h-m-a-n, San Diego SEB.
25 What did -- what does that mean, San Diego SEB?

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1 A That's the San Diego office of the Sanitary Engineering
2 Branch. Sam Kalichman was the regional engineer. That was
3 his title at that time. And I reported to him.
4 Q Directing your attention, please to the item – the
5 paragraph marked 2 at the bottom of the first page of
6 Exhibit 515.
7 A Yes.
8 Q It refers to tank bottom. And I'll – it's a short
9 paragraph, so I'll read it. It says:
10 "The preferred inside coating system
11 seems to be a combination of AWWA IPS
12 number 5 (coal tar enamel) on the tank
13 bottom and the lower part of side walls,
14 with IPS number 6 (cold-applied coal tar
15 paint) on the upper walls. However,
16 utilities recoating an existing tank may
17 put the IPS number 6 on the entire tank
18 (e.g., Koppers Supertank or equiva-
19 lent)."
20 Do you recall any particular water utilities in which
21 that occurred for a reservoir coating?
22 A No, I don't.
23 Q Do you recall developing any explanation as to why that
24 occurred on occasion?
25 A Why the –

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1 Q Why instead of two different coal tar coatings, they
2 would use only one.
3 A No, I don't recall that.
4 Q On this first page of Exhibit 515, it indicates:
5 "Several additional items of interest on
6 this subject have come to my attention."
7 And we discussed one of those items of interest a
8 moment ago.
9 Do you recall how these items of interest came to your
10 attention?
11 A I don't recall specifically. But I would – it would
12 not be unreasonable to indicate that I had had follow-up
13 conversations with Bill Harper and other staff in the
14 department and that I may have picked up additional informa-
15 tion from those conversations or from water utilities.
16 Q And was it your purpose in this memorandum to relay
17 that additional information to your staff?
18 A Not just to my staff, but to the entire statewide
19 staff, so we basically shared some new-found knowledge, if
20 you will.
21 Q Would you review, please, the next exhibit which was
22 previously marked in this case as Exhibit 516. I'm not sure
23 you need to review the entire document.
24 A Okay.
25 Q But review as much of it as you need to.

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1 While you're doing that, for the record, Exhibit 516 is
2 an October 5, 1982 memorandum from W.C. Gedney to C.E.
3 Anderson, subject: City of San Bernardino Tank Coating
4 Problems.
5 A Okay.
6 Q Mr. Anderson, do you recall receiving this memorandum
7 back in October 1982?
8 A I don't recall. But obviously I did.
9 Q Is the W.C. Gedney the Bill Gedney we mentioned
10 earlier?
11 A Yes.
12 Q Was this a memorandum that Mr. Gedney prepared on his
13 own, or do you recall whether you asked him to prepare it?
14 A I don't recall asking him to specifically prepare this
15 memorandum. It was standard procedure for staff to document
16 work on – and, you know, follow up on investigations,
17 complaints, situations, incidents. And at that time, there
18 obviously was an interest in tank coatings. And so it would
19 have – probably wouldn't command this – that much work now
20 for anything later. And –
21 Q But at the time, it was – was it sufficiently impor-
22 tant to call for this amount of effort?
23 A Yes.
24 Q And this would have been, I take it, standard operating
25 procedure for your staff, to prepare such a memorandum.

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1 A Yes.
2 Q The next exhibit I'd like you to review, please, is
3 Exhibit 517. For the record, this is an August 6th, 1982
4 memorandum from John M. Gaston, Chief, Sanitary Engineering
5 Branch, to H.F. Collins, Ph.D., Deputy Director, Environmen-
6 tal Health Division.
7 A Yes.
8 Q In the upper portion of the first page of Exhibit 517,
9 there's some handwritten items, including "C. Anderson."
10 Do you recognize the handwriting?
11 A The C. Anderson is somebody else. Probably from head-
12 quarters.
13 The other stuff is in my writing.
14 Q And the other stuff is that routing system that you –
15 A Right.
16 Q – described.
17 A Right.
18 Q As well as the words, "File: Reservoirs."
19 A Right.
20 Q I believe you previously identified Mr. Gaston as
21 someone to whom you reported through the regional engineer.
22 A Yes.
23 Q And if I recall correctly, Mr. Gaston reported to Mr.
24 Collins.
25 A Correct.

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1 Q In paragraph 3 of Mr. Gaston's memorandum which we've
2 marked as Exhibit 517, it refers to the following, quote:
3 "We have seen a recent rash of incidents
4 where either tri or tetrachloroethylene
5 has been found in water supplies because
6 of leaching from new tank linings.
7 Generally these liners involve a coal
8 tar compound and utilize a solvent
9 (TCE/PCE) in the application of the
10 paint or liner. This problem may have
11 been with us for some time, but we never
12 saw it because we never looked."
13 Do you recall discussing that point, that the problem
14 "may have been with us for some time, but we never saw it
15 because we never looked"?
16 A Discussing it with anybody?
17 Q Correct.
18 A No, I don't specifically.
19 Q Do you recall having that understanding, or coming to
20 the same conclusion yourself?
21 A Well, I had that understanding we – that we – as you
22 alluded to earlier, that there was a problem of analytical
23 capability. There was a lack of cognizance, if you will, on
24 any health effects concerns about many of these compounds.
25 And I don't remember, but sometime prior to this 1980

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1 period, that – I mean, it – I'm talking about very generi-
2 cally, about volatile organic compounds. Whether as a –
3 contaminating groundwater is a – something that was used in
4 the tank coatings.
5 Q Over on page 2 on the cc's, there's a reference to
6 district and regional engineers. And if I recall, you were
7 a district engineer at this point.
8 A Correct.
9 Q If you would look, please, at Exhibit 518.
10 I'll note for the record this is a November 29, 1982
11 memorandum from Chet Anderson, district engineer, to San
12 Bernardino district staff, subject: Koppers Co. Coatings
13 Litigation.
14 A Yes.
15 Q Do you recall this memo?
16 A I don't specifically, no. It's obviously my signature
17 there.
18 Q Okay. The word "Chet" –
19 A Right.
20 Q – is in your handwriting.
21 In the first paragraph, you refer to:
22 "A reliable source has advised me that
23 Koppers Company is hurting in terms of
24 decreased sales due to health concerns
25 about PCE and tank coatings."

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1 Do you recall who the reliable source was?
2 A I don't, you know, recall this whole incident, actu-
3 ally.
4 Q In the second paragraph, you state:
5 "You are therefore advised to use 'prac-
6 tical discretion' in your discussions of
7 tank coatings with water purveyors,
8 consultants, et cetera."
9 Can you explain what you meant by "practical discre-
10 tion" and putting those words in quotes.
11 A I'd be guessing at this time. I was – I imagine I was
12 just telling them to use their heads.
13 Q So it was to avoid possible litigation?
14 A Right. That's –
15 Q We've been going, I guess, about an hour and 45 min-
16 utes.
17 Could you use a break?
18 A Quick one.
19 Q Okay. Why don't we do that.
20 (Recess)
21 MR. JACOBSON: Well, I want to just – excuse me,
22 Mr. Anderson. I have to address a collateral matter I just
23 learned about.
24 The court reporter sent Mr. Parlett's deposition
25 to him with instructions to return it to her. And since

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1 he's one of our clients, that doesn't seem appropriate.
2 He did sign it. He signed it and he's returned
3 it, and we haven't seen his deposition.
4 And the court reporter was contacted by my associ-
5 ate, Lisa Stolzy. Ms. Stolzy reports to me that the court
6 reporter said she was under direction from you to send it
7 directly to the individuals with instructions to return it
8 to the court reporter.
9 I was hoping that you would agree that you'll
10 instruct the court reporter to make it clear that they
11 should come to us so that we can review them with our cli-
12 ents, because these folks are unskilled in the deposition
13 process. And of course, they will immediately comply with
14 what a court reporter tells them to do.
15 And I didn't think at any time that we – there
16 was any discussion on the table about the court reporter
17 sending it directly to our clients without going through our
18 office.
19 MR. BARR: Let me check into it.
20 Do you know the name of the court reporter?
21 MR. JACOBSON: I – whoever did Parlett's. And it
22 must have been a lady, because Ms. Stolzy referred to her as
23 a female. And I don't know whether it would have been
24 Kristi Vitale or which one of the folks at the court
25 reporter service that you've been using.

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1 MR. BARR: Let me -- I think it was Mark Rigau who
2 took that deposition. So let me check with him.
3 MR. JACOBSON: Okay. I appreciate it.
4 And the other thing that I am going to continue to
5 take issue with you on is Mr. Harper.
6 Now, for the record, I think he'd know that --
7 either Mr. Harper is an expert, which under Rule
8 26(b)(4)(C), he is entitled to receive a reasonable fee, or
9 he's a witness who's been -- what do you call it? -- asked
10 to be there, subpoenaed to be there, who is entitled to the
11 $40 witness fee plus mileage. But in no event is he -- can
12 he be compelled to participate in this action for free.
13 So if you would like take that under advisement
14 and let me know in the morning --
15 MR. BARR: Well --
16 MR. JACOBSON: -- that's fine.
17 MR. BARR: Now, I think what -- I know we've -- we
18 agreed yesterday that his deposition would be continued.
19 The circumstances, as far as compensation, under Rule 26.
20 If you want to state a position in writing, go
21 ahead and do that, and we can bring this to the attention of
22 either Justice Lucas or someone else as the need arises.
23 But I'm not going to spend more time and chew up
24 more deposition transcript pages going over this issue with
25 you, Mr. Jacobson, again and again and again.

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1 MR. JACOBSON: You can't --
2 MR. BARR: So --
3 MR. JACOBSON: -- take his deposition for free.
4 MR. BARR: Well, we'll see about that. And as far
5 as I'm concerned, he's an ordinary witness, whether or not
6 you've hired him recently to provide consulting services to
7 you.
8 BY MR. BARR:
9 Q So back to you, Mr. Anderson, if I may.
10 I'd like you, please, to review an exhibit that was
11 previously marked in this case as Exhibit 524.
12 For the record, Exhibit 524 is titled "California
13 Survey of Solvents Leaching from Cold-Applied Coal Tar
14 Paints used as Internal Coatings in Potable Water Storage
15 Tanks." The author on the first page -- it purports
16 to be Joseph P. Como, PE, California Department of Health
17 Services.
18 Do you recall ever having seen this document before?
19 A I'm sure I did. But I've forgotten anything about its
20 existence.
21 Q Do you know who Joseph P. Como is?
22 A I've kind of come to the conclusion that I remember a
23 guy named Joe Como who worked up in the Berkeley office and
24 probably had something to do with this, as evidenced by this
25 report.

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1 Q Do you know -- do you recall if this document was
2 presented at a paper at a conference of some kind?
3 A I don't know that at all.
4 Q Do you have any recollection as to conferring with Mr.
5 Como or providing him with any information that went into
6 this document?
7 A I really don't recall anything about that.
8 Q Do you have any recollection as to whether or not Mr.
9 Como was charged with -- by "charged," I mean asked to
10 prepare or collect information on this subject?
11 A I don't recall or don't know.
12 Q All right. The next exhibit I'd like you to review is
13 Exhibit 526. This was previously marked in this case.
14 And for the record, Exhibit 526 is an April 25, 1984
15 memorandum from Clarence Young to Cliff Bowen, Frank
16 Hamamora, and Bill Gedney, subject Tank Coating Policy.
17 Attached to it is an April 2, 1984 memorandum from
18 Endel Sepp, E-n-d-e-l S-e-p-p, to Clarence L. Young.
19 A Yes.
20 Q Do you have a recollection, Mr. Anderson, of having
21 seen this document before today?
22 A I don't recall it, but I'm sure I saw it.
23 Q What leads you to be sure you saw it?
24 A Because I saw all this stuff. The district engineers,
25 you know, any kind of general information that they -- it's

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1 pretty much sent to them.
2 Q Okay. And on the April 25, '84 memorandum, the first
3 page of this exhibit, it states at the next-to-last sentence
4 of that paragraph:
5 "I understand that this matter will be
6 discussed at Asilomar."
7 Do you know what Asilomar is?
8 A Yes.
9 Q What's that reference to?
10 A Asilomar is a state conference grounds in a really
11 undesirable place near Monterey and Pacific Grove on the
12 ocean, and we had routine staff meetings there of our man-
13 agement staff.
14 Q When you say "undesirable," I take it you're being
15 facetious.
16 A I am being facetious. It's beautiful.
17 Q Do you recall this subject being discussed at Asilomar
18 in 1984?
19 A Not specifically.
20 Q And the attached April 2, 1984 memorandum indicates
21 it's from Endel Sepp.
22 Do you know who that gentleman is?
23 A Yes, I do.
24 Q Who is Mr. Sepp?
25 A Mr. Sepp was an engineer who worked in the Berkeley

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1 office in what we referred to as the technical section. It
2 was, like, a headquarters where they did special studies.
3 And Joe Como would have been there, Steve Nelson, at that
4 time they did that study. They had -- they were not in dis-
5 tricts or regions. They were in a specialty group that did
6 work on statewide problems.
7 Q I'm sorry. What was the last part of your --
8 A They worked on --
9 Q -- answer? That they worked on statewide problems?
10 A Yeah. Or general issues that applied not just to
11 specific water systems.
12 Q In the third paragraph of the April 2, 1984 memorandum,
13 the third sentence reads:
14 "The contaminants" -- and the contami-
15 nants that are referred to are PCE and
16 TCE --
17 A Paragraph 3?
18 Q Correct.
19 A Okay.
20 Q Yeah. The third paragraph.
21 "The contaminants remain in water for
22 years after application."
23 Do you recall learning that during the early 1980s?
24 A No. That's contrary to any understanding that I had
25 and, you know, my general knowledge of the situation on

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1 organics and related to tank coatings.
2 Q Turning to -- by the way, who is Clarence Young at this
3 time?
4 A Clarence Young was the head of that technical section
5 in Berkeley. He was probably at the same classification as
6 a regional engineer but, again, in a specialty unit.
7 Q Do you have any information as to where Mr. Sepp got
8 the information for his April 2, 1984 memo?
9 A He would have gotten it from all of the various written
10 communications, most of which we've reviewed as exhibits.
11 All these, those copies would have gone to the Berkeley
12 office. They would have gotten to Mr. Young, his section.
13 There would have been files. And then through discussions,
14 contacts. In other words, he was -- if Joe Como was there,
15 he was probably sitting next to him or very close.
16 Q In the fourth paragraph, it refers to a questionnaire
17 which had been sent out to various water systems.
18 A Yes.
19 Q It says:
20 "Results of the questionnaire were sum-
21 marized by Joe Como, the expert."
22 Was Mr. Como generally recognized as sort of the expert
23 on this particular subject of tank coatings?
24 A I actually detect a little sarcasm in Mr. Endel's memo.
25 But Mr. Como, as evidenced by this 524, had done a lot of --

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1 and that was the role of this technical section. Somebody
2 would get a project and, while the district engineers and
3 the staff were working on water systems and issues and
4 sometimes learned about these things very intimately because
5 of the particular thing, then that person up there would try
6 and generalize it and do literature research and interview
7 and call other states and stuff like that.
8 Q Was this technical section, in other words, a -- some-
9 thing of a collection and clearinghouse for information?
10 A It was. It was also -- they were -- you know, they --
11 some of them had special credentials in terms of, you know,
12 their background. Endel Sepp was a almost world-renowned
13 expert on use of waste water sewage sludge for irrigation,
14 as an example. But he did many other things, so --
15 Q So he was a fairly qualified individual.
16 A Yeah. He -- and most of these people were. And again,
17 when they took and focused on a specific issue for -- you
18 know, spend considerable time -- and I think Endel was of
19 Estonian origin, and he had a very interesting sense of
20 humor. And I think that's it. Just a little shot at his
21 buddy, or something.
22 Q All right. You're referring to Mr. Como.
23 A Mr. Como.
24 Q All right.
25 A I like that, "the expert."

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1 Q Over on page 2 under the heading "Issues of Concern."
2 Item 1 refers to old tanks.
3 "Some tanks which have been coated 10 to
4 15 years ago are now showing high levels
5 of PCE and TCE when analyzed."
6 The high levels of PCE and TCE, is that in the water in
7 those reservoirs?
8 A I would guess that's what the reference means.
9 I don't recall this issue, and I don't recall situa-
10 tions -- any specific situations that are as alluded to
11 here. But there must have been something to inspire this.
12 Q Do you have any recollection of providing any informa-
13 tion to Mr. Sepp as of March or April of 1984?
14 A Not specifically. I don't remember ever talking about
15 this. He uses my name, or somebody named Anderson, somebody
16 referred to one of my memorandum.
17 Q I'm sorry? Where are you referring to?
18 A On page 1 at the very bottom. He refers to my legal
19 advice to staff.
20 Q I see.
21 I'd like you to look next at Exhibit 528, previously
22 marked as an exhibit in this case.
23 A Okay.
24 Q While you're looking that over, it is dated December
25 30, 1985. The memorandum is addressed to all large public

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1 water systems from Sanitary Engineering Branch, subject:
2 Tank Coatings.
3 A Okay.
4 Q The -- it indicates that this is a memorandum from
5 the Department of Health Services, and the address is
6 Sacramento, California.
7 A Right.
8 Q Was the -- my interpretation of this document is that
9 it's the -- it's from Peter A. Rogers, chief of the Sanitary
10 Engineering Branch.
11 Did Peter Rogers -- you indicated that John Gaston had
12 been in that position.
13 Was Mr. Rogers his successor in that position?
14 A Yes, he was.
15 Q And do you recall when that succession occurred?
16 A In approximately May of 1983.
17 Q Had the chief of the Sanitary Engineering Branch previ-
18 ously been located in Berkeley?
19 A Correct.
20 Q So this reflects a move of the chief's office up to
21 Sacramento.
22 A The move of the department -- all the department unit
23 headquarters had been -- had occurred prior to Mr. Gaston's
24 leaving, and disagreement over how much time he should spend
25 in Sacramento was involved in his decision to change his

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1 course in life.
2 Q Do you have a recollection of receiving a copy of this
3 December 30, 1985 memorandum?
4 A Not specifically. But I'm sure I did.
5 Q What was your position at this time?
6 A By December 30th, I was the regional engineer, regional
7 chief for Southern California region.
8 Q Okay. Did that -- change from district engineer to
9 regional engineer occur sometime in 1985 or some other time?
10 A That occurred -- no. That occurred subsequent to May
11 of -- or '83 and prior to this time. Probably in late '83,
12 I think.
13 Q Do you have any understanding as to why this memo was
14 sent out at this time, December 30, 1985?
15 A I -- it was a -- you know, part of the continuum of
16 trying to develop information and update water utilities and
17 provide them with -- and, you know, even staff with -- make
18 sure there was consistent handling on these issues.
19 There was a difference, you know, sometimes of opinion
20 as to, you know, if you've got an issue, what authority, you
21 know, the department staff had. Sometimes individual dis-
22 trict engineers would take it on themselves to move a little
23 faster, and sometimes that would precipitate -- you know,
24 they would -- for example, they -- somebody would say, "I
25 want to put this coating." And they would say -- they would

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1 disapprove that, and then there might be an appeal made or
2 somebody else -- they talked to somebody else.
3 And anyway, there -- this was consistency in trying to
4 get the policy and making sure everybody understood the same
5 thing.
6 Q Okay. Dissemination of information.
7 A Right.
8 Q Turning to the second page of Exhibit 528, the next-to-
9 last paragraph.
10 A Yes.
11 Q It reads -- I'll just read the first sentence:
12 "Since we began sampling of water for
13 organic chemical constituents, we
14 have" --
15 MR. JACOBSON: "Contaminants," you mean.
16 MR. BARR: "Organic chemical contaminants."
17 "We have found several previously coated
18 tanks to continue to leach significant
19 amounts of solvent even several years
20 after application of the coating."
21 BY MR. BARR:
22 Q Do you recall that?
23 A I -- as I indicated before, I -- this is kind of, you
24 know, refreshing my memory, but not -- I didn't really have
25 any direct experience with that occurring. I don't remember

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1 any particular situations that I was aware, where that
2 occurred.
3 Q Do you recall any discussions of that issue with any-
4 one?
5 A No. Other than, you know, I read -- obviously, there
6 was some discussion that went on in a kind of a generic
7 statewide basis. But --
8 Q If you would review, please, what was marked as Exhibit
9 548 in this case.
10 If you've reviewed this document, let me ask you:
11 There are some handwritten notation -- there is a handwrit-
12 ten notation, "TCE/PCE" in the upper right corner of Exhibit
13 548.
14 A Right.
15 Q Do you recognize that handwriting?
16 A No.
17 Q Turning back to Exhibit 528 --
18 A Right.
19 Q -- the one we just looked at, in the upper --
20 A Right.
21 Q -- right-hand corner, there's also writing, "Library-
22 Tank Coating."
23 Do you recognize that handwriting?
24 A Yes.
25 Q Whose handwriting is that?

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1 A That's mine.
2 Q It appeared, on reviewing these documents -- and if my
3 characterization is erroneous, someone will let us all know,
4 that these are very similar documents.
5 Do you have any recollection as to why Exhibit 548
6 would have been sent out on January 4, 1985, and, less than
7 a year later, almost a year later, a very similar document
8 would have been sent out in the form of Exhibit 528?
9 A No. I'd be guessing. Wait a second.
10 No. I -- my first reaction was that this is December
11 30th, '85, and this is probably January 4th, 1986. But
12 they're enough different -- what occasionally happened,
13 although I can't suggest that, is that if there -- sometimes
14 a district or region would send out their own document.
15 But it would be unlikely that it would come out on the
16 Sacramento letterhead.
17 So I don't.
18 Q These --
19 A I'm guessing. Stop guessing, huh?
20 Q All right. I understand. It appears that both of
21 these were signed by Peter A. Rogers.
22 A Right.
23 Q So these both would have come out of the same office;
24 is that right?
25 A Yes. Yeah. That's --

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1 Q All right. The next exhibit that was previously marked
2 that I'd like you to review is Exhibit 562.
3 This appears to consist of a buck slip or cover sheet
4 bearing the date November 16, 1987. And attached to that is
5 an article titled "Coal Tar Enamel as a Water Tank Lining,
6 Past, Present, Future, William B. Harper, PE," and it gives
7 his address.
8 A Yes.
9 Q Do you recall having seen this document before today?
10 A I don't specifically. But that's my handwriting on the
11 buck slip, so --
12 Q There's also some handwriting in the upper right corner
13 of the -- page 1 of the paper. It's "tank coating" with a
14 double underline.
15 A Yes.
16 Q Do you know whose handwriting that is?
17 A I am not sure on that one.
18 Q On the note that you wrote on the first page, it says:
19 "Interesting. Suggest you scan page
20 P1-5 and read the rest. Chet."
21 Again, is the D, B, J, and T your staff?
22 A Yes.
23 Q I think we talked about -- who's the D again?
24 A D is Diana Barich. She was the new district engineer.
25 Q And the B is Bill Gedney.

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1 A Right.
2 Q The J is Jeff Stone.
3 A Yes.
4 Q And who is the T?
5 A I can't remember.
6 Q Okay. Was there --
7 A Oh, that's Tina. I bet that's -- no, I'm sorry.
8 Don't know who that is.
9 Q Was there a particular reason that you suggested they
10 read at least more closely the rest of the paper and simply
11 scan the first five pages?
12 A It was just because we got so much materials, trying to
13 just make efficient use of staff time and just glancing.
14 The first five pages were kind of background generic stuff,
15 and it looks like there -- starting page 6, there's more
16 specific information and current information at that time.
17 Q All right. You had mentioned -- we had talked a little
18 bit about Mr. Harper earlier.
19 Do you know of other corrosion engineers in the State
20 of California with expertise on the subject of corrosion
21 coatings?
22 A I actually had -- probably have met some, but I can't
23 recall any particular names of people that -- nobody made
24 much of an impression on me, I guess.
25 Q Is there an association of -- you know, a professional

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1 association whose membership are solely corrosion engineers?
2 A Yes, there is. I think it's called NACE, National
3 Association of Corrosion Engineers, I believe. I'm not a
4 member, nor am I too familiar with them. I've seen their --
5 some bulletins and their, you know, announcement for the
6 seminars and things.
7 Q Do you know where they're headquartered?
8 A No, I don't.
9 Q All right. If I may borrow back you the exhibits that
10 we've looked at so far. Thank you.
11 Okay. I'd like to mark as Exhibit 701 a three-page
12 document dated March 23, 1978. It is -- purports to be from
13 C.E. Anderson, District Engineer, to the San Bernardino
14 Water Utilities Corporation, attention Herbert B. Wessel,
15 General Manager.
16 While you're reviewing that, I'll state for the record
17 that it bears document production identification numbers in
18 this case CITY11127 through 29.
19 I realize this was some time ago -- 1978.
20 Do you have a recollection of sending this letter to
21 Mr. Wessel?
22 A I don't at all. As a matter of fact, I'm very puzzled
23 by the -- who the San Bernardino Water Utilities Corporation
24 is and why we -- something's stirring around back there
25 that -- I -- seems to me like that the -- there was some

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1 separate -- I don't know. I can't -- there's something way
2 back there -- let's -- anyway.
3 This is -- I don't remember this specifically. And the
4 name of the water utility doesn't -- it's trying to ring a
5 bell, but it isn't. I know Mr. Wessel, who he is and was.
6 Q Is -- Herbert B. Wessel, is that the Mr. Wessel you
7 described as being the general manager of the San Bernardino
8 Water Department?
9 A He was, for a period of time during my time with the
10 department.
11 Q In the first paragraph it states:
12 "On February 22, 1978, Fahd Rizk" --
13 F-a-h-d R-i-z-k -- "of this office made
14 a field review of San Bernardino Water
15 Utilities Corporation with Joe
16 Bocanegra, Engineering Supervisor."
17 Is that the same Joe Bocanegra that we described
18 earlier?
19 A Yes.
20 Q And do you recall who Mr. Rizk was?
21 A The pronunciation is "Risk." "Fahad Risk."
22 He was a staff engineer in my office for a two-year
23 period. And it obviously included this February 22nd.
24 Q Was he one of your subordinates?
25 A Yes.

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1 Q In the third paragraph, it states:
2 "The major problem is with the Cajon
3 Reservoir which is in very poor condi-
4 tion with cracked walls and beams."
5 Why was that a major problem?
6 A That -- because external contamination can get into the
7 water in the reservoir. Either seepage or rodents or some-
8 thing.
9 Q Can water from the reservoir exit through the walls
10 into the ground in such a situation?
11 A It's possible. I don't recall this reservoir, the
12 precise situation. But --
13 Q Do you -- I think I know what your answer may be. But
14 do you have a recollection as to what material the Cajon
15 Reservoir was made out of?
16 A No, I don't recall.
17 Q Where it refers to cracked walls and beams, the walls,
18 I assume, are the shell of the reservoir.
19 Do you have an understanding as to what the reference
20 to the beams is though?
21 A I would guess they are roof beams. But I couldn't be
22 sure.
23 Q Okay.
24 A Cracked walls would suggest concrete. But that's total
25 supposition.

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1 Q Okay. If the Court Reporter would please mark as
2 Exhibit 702, I believe is the next in order, a multi-page
3 document. The date it bears is August-December 1981. It
4 purports to be from Mark Bartson to Chet Anderson. It also
5 refers to a typing date of January 26, 1982.
6 Do you recall having received this document in the
7 early 1982 time period?
8 A I don't specifically recall. I obviously did.
9 Q On the last page of this exhibit, it appears to be a
10 page of handwritten notes.
11 A Yes.
12 Q Do you recognize the handwriting --
13 A Yes.
14 Q -- on those notes?
15 Whose is that?
16 A Mine.
17 Q Indicates on that page of notes:
18 "Info from Dave Spath. Samples taken
19 September 1981."
20 Who is Dave Spath, if you know?
21 A At that time?
22 Q Yes.
23 A He was in the technical section in Berkeley.
24 Q That's the same section as Mr. Sepp was in?
25 A Mr. Sepp, Mr. Young, Mr. Nelson, Mr. Como.

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1 Q Was this an update that you had requested from Mr.
2 Bartson or --
3 A Well, I think I --
4 Q Yeah.
5 A I assume I had. Or it was just him doing his job as a
6 matter of course.
7 Q As Exhibit 703, the Court Reporter to mark a multi-page
8 exhibit, the first page of which is an October 11, 1982
9 letter from Henry R. Stoner. It's on Koppers Chemicals and
10 Coatings letterhead to Mr. Chet Anderson.
11 For the record, attached to the letter dated October
12 11, 1982, are six pages of technical reference from the
13 state -- New York State Department of Health, Office of
14 Public Health, Office of Local Health Management.
15 Mr. Anderson, do you recall having received what we've
16 marked as Exhibit 703?
17 A Not specifically. But I remember some names there and
18 sure this is -- sure I saw it at the time.
19 Q Do you recall a meeting in October of 1982 with Mr.
20 Stoner and others?
21 A I don't.
22 Q Do you know who M.L. Bowden is?
23 A By name, I assume he's a guy that was known as Doc
24 Bowden, I believe. And I -- does it say he was at the
25 meeting? I probably have met him, but I don't recall

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1 specifically. I think I may have talked to him on the
2 phone.
3 Q Do you recall if you were --
4 A He was there. Okay.
5 Q It indicates that Mr. Bowden was present --
6 A Yeah. I --
7 Q -- at the meeting?
8 A I didn't recall that. I don't recall either gentlemen.
9 Their names are familiar.
10 Q The other gentlemen that are mentioned -- Gedney,
11 Stone, and Bartson -- those are all your subordinates at
12 the --
13 A Right.
14 Q -- time.
15 A Right.
16 Q Does this -- does reviewing this letter refresh your
17 memory as to the nature of the discussion at the meeting?
18 A It doesn't. I suggest -- I'm sure we talked about
19 Koppers products or experiences or something.
20 Q Do you recall who Mr. Stoner is?
21 A The name just rings a bell. I -- nothing specific.
22 Q Do you have any recollection of speaking with either
23 Mr. Stoner or Mr. Bowden on any other occasion before or
24 after October of '82?
25 A I don't specifically.

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1 Q As Exhibit 704, I'd like the Court Reporter to please
2 mark a three-page exhibit. The first page is a January 13,
3 1983 memorandum from Joe Como, Sanitary Engineering Branch,
4 to John Gaston, Chief, Sanitary Engineering Branch, on the
5 State of California, Department of Health Services letter-
6 head. And there is a two-page attachment, a form which is
7 entitled, "Coal Tar Tank Coating Data Sheet."
8 Mr. Anderson, do you recall ever having seen this
9 document before?
10 A No, I don't.
11 Q Is the -- is Joe Como the individual that you referred
12 to earlier?
13 A As Joe Como? Yes.
14 Q As part of the Department of Health Services --
15 A Right.
16 Q -- Sanitary Engineering --
17 A Yes.
18 Q -- Branch.
19 And John Gaston is the chief that you referred to
20 earlier as well.
21 A Yes.
22 Q Okay. In the second paragraph in which Mr. Como
23 states:
24 "These are some of my thoughts on future
25 avenues of investigation."

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1 If you'd please review item 5. I'll read it in part.
2 It says:
3 "For those systems that now have solvent
4 leaching problems and for those that
5 will inevitably have solvent leaching
6 problems in the future, establish
7 acceptable levels of solvents in drink-
8 ing water (especially PCE)."
9 Do you recall a discussion of that issue within the
10 Sanitary Engineering Branch?
11 A Not in this context, no.
12 Q What's your understanding, if any, as to what Mr. Como
13 was referring to when he said:
14 "For those systems that will inevitably
15 have solvent leaching problems in the
16 future"?
17 MR. JACOBSON: Objection. Calls for speculation.
18 BY MR. BARR:
19 Q You may answer.
20 A Actually, I forgot what the question was.
21 MR. BARR: Could you read it back, please.
22 (The tape was replayed; proceedings continue as fol-
23 lows)
24 THE WITNESS: -- what he meant?
25 ///

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1 BY MR. BARR:
2 Q Yes.
3 A I am not sure.
4 Q Now let's mark as Exhibit 705 a -- what appears to be
5 a memorandum on State of California, Health and Welfare
6 Agency, Department of Health Services letterhead, dated May
7 16, 1983, to all large community water systems in Imperial,
8 Riverside, and San Diego Counties from K.W. Campbell, Dis-
9 trict Engineer, Sanitary Engineering Branch, subject Tank
10 Coatings.
11 A Okay.
12 Q Do you recall ever having seen this document before?
13 A I do.
14 Q And when do you recall the first time you've seen it?
15 A I can't tell you that, but --
16 Q Would it be approximately May of 1983?
17 A Yes.
18 MR. JACOBSON: May I borrow that from you for a
19 moment? Thanks.
20 BY MR. BARR:
21 Q Who is K.W. -- or who was K.W. Campbell at this time?
22 A He was the district engineer of the San Diego district,
23 which included those three counties -- Imperial, Riverside,
24 and San Diego. So he was my counterpart. My district was
25 San Bernardino, Inyo, Mono, and Alpine Counties.

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1 Q Was his essentially an adjoining district --
2 A Yes.
3 Q -- to yours?
4 A And we both reported to the same regional chief, Sam
5 Kalichman.
6 Q What does the K stand for --
7 A Kirkham.
8 Q K-i-r-k-h-a-m?
9 A Correct.
10 Q And you both reported to Mr. Kalichman.
11 A Yes.
12 Q On the second page, there are a number of -- in num-
13 bered paragraph 4 -- numbered subparagraph 4, it states
14 that:
15 "The following table lists some of the
16 volatile organics commonly found in cold
17 applied coal tar coatings."
18 And then it lists several constituents in one column
19 and then the recommended action level for each in the next
20 column.
21 I think we talked earlier about action levels.
22 When it says "recommended action level," was this --
23 were these action levels that had already been adopted, or
24 were these proposed?
25 A Well, they're -- action levels are never adopted,

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1 because adopted in a -- has a connotation of being a legal,
2 you know, process and going through a regulatory thing.
3 "Action levels," it's a term that has a lot of, you
4 know, different interpretations, if you will. I mean, they
5 were used at different times, different ways.
6 And the term "recommended action level," meant the same
7 as "action level." And the word -- what "action level"
8 meant -- all these were, were nonenforceable, basically
9 health advisories. They were numbers for guidance to get
10 people -- and it was -- in the absence of having a drinking
11 water standard at any -- the federal government didn't have
12 standards for any of these things, and the state didn't have
13 them until after this time.
14 Q We've heard also to MCLs. And remind me what MCL
15 stands for.
16 A Maximum contaminant level.
17 Q Did these -- were maximum contaminant levels set at
18 these action level numbers?
19 A They may have been or -- may have been. In fact, I
20 think for TC and PC, they were. I believe the MCLs are the
21 same as these numbers. But they weren't necessarily --
22 there's just -- again, setting the MCL has a more rigorous
23 process where you consider a lot more additional factors
24 than you do with action levels.
25 Action levels is kind of a "best information we have

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1 right now, and based on health effects, we're going to try
2 and give some guidance to people." That kind of thing.
3 Q The MCLs, were these developed by the state or by EPA
4 or by someone else?
5 A They were developed both by the state and by EPA.
6 California actually adopted MCLs for some of these chemicals
7 before the EPA did, and then EPA did. And sometimes -- and
8 to this date, the state has different MCLs than EPA on some
9 constituents.
10 Q All right. As Exhibit 706, I'd like the Court Reporter
11 to mark a November 21, 1984 memorandum from Jeff Stone to
12 C.E. Anderson with a two-page -- or excuse me, with two
13 pages of attachments. One is a coal tar tank coating data
14 sheet related to Riverside Highland Water Company, and then
15 a page of handwritten notes relating to Riverside Highland
16 Water Company.
17 Mr. Anderson --
18 A Yes.
19 Q -- have you an opportunity to review this Exhibit 706?
20 A Yes.
21 MR. JACOBSON: Do you have a copy for us?
22 MR. BARR: Oh, I apologize. Sure do.
23 BY MR. BARR:
24 Q Having reviewed this document, do you have any
25 refreshed recollection as to having seen this before today?

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1 A Yes.
2 Q Is Jeff Stone the individual we referred to earlier?
3 A Yes.
4 Q In the bottom paragraph, there is a reference -- well,
5 I'll just read the relevant sentence.
6 Do you see in that bottom paragraph, it says:
7 "Numerous samples of coating material
8 and solvent (applied and unused) were
9 collected by the contractor and SEB
10 during this period. The results did not
11 provide us with extremely meaningful (or
12 at least understandable) information
13 other than to verify that PCE was indeed
14 present in measurable amounts in the
15 material applied to the tank, present in
16 the 'old' Koppers coating material and
17 solvent and present in the 'new' Koppers
18 coating material and solvent (see
19 attached data summary sheet). Koppers
20 has contended that PCE is not in the
21 formulation of their new '2000' solvent
22 and that they do not add PCE to their
23 Type III coating material."
24 Do you have a recollection of this problem occurring in
25 the context of the Riverside Highland Water Company?

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1 A Yes.
2 Q Do you recall this problem occurring in the context of
3 other water systems?
4 A Not in – in the most part, in the particulars of that
5 situation. And this was an anomaly amongst anomalies, if
6 you will. They –
7 Q What made this unusual?
8 A Well, they – as I kind of indicate, my recollection is
9 that they just – the water company, which at that time –
10 and I don't impugn the current – management was very poorly
11 managed. And they weren't paying attention, and despite
12 input from the department.
13 But I think there was a lot of confusion about what
14 information we were getting. There was this whole – this
15 transition of all the new stuff. And this was not something
16 that we experienced that I can recall in any other situation
17 and to this degree that we found it here.
18 Q Do you have a recollection of what the new 2000 solvent
19 consisted of?
20 A No. I only recall that there was discussions about
21 Koppers changing their formulation, you know, from something
22 before and something after. And that's – I think Jeff's
23 use of "old" and "new" is trying to have that connotation.
24 Q Up above in the third paragraph of the – Exhibit 706,
25 it reads:

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1 "The tank walls and ceiling were coated
2 with Koppers Supertank Solution and the
3 floor was coated with Koppers hot-
4 applied coat tar enamel. Although the
5 contractor initially claimed he did not
6 use any 'old' Koppers coating material
7 or solvent, it became evident that he
8 most likely had. This was later veri-
9 fied by the contractor's own admission."
10 Do you recall any other instances where a contractor
11 used old formula material when they should have been using
12 the new formula?
13 A I don't. Not specifically.
14 Q Do you have a recollection that this was not a unique
15 instance?
16 A Well, let me clarify that the old material, up to a
17 certain point that's all there was. And we were aware that
18 people used Koppers' products. So, yes.
19 Did they use old products? Yeah. I mean, before some
20 date when they changed or allegedly changed the product, a
21 number of people used that previous product.
22 Q Are you aware of contractors using the previous product
23 after the new formulations became available?
24 A This refreshes my memory on this instance. I don't
25 remember specifically any others. But there – this

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1 suggests there was a little bit of a gray area for a short
2 time there.
3 Q Would it surprise you to learn that there were other
4 instances where that –
5 A No.
6 Q – occurred?
7 A No.
8 Q I'd like to have marked as Exhibit 707 –
9 A Could I interrupt for a second?
10 Q Sure.
11 A I'd like to take a three-minute break to use the rest
12 room. I don't know what your plan is here. But –
13 Q No. Three minutes, five minutes.
14 A Okay.
15 THE RECORDER: We're off the record.
16 MR. BARR: Take the time you need.
17 (Off the record)
18 MR. BARR: During the off-the-record interval,
19 counsel for the parties discussed scheduling. And in light
20 of the plans by counsel for the parties and the witness
21 himself, what we've agreed to do is continue for about
22 another 15 minutes and then break for the evening and resume
23 tomorrow, here, at 9:00 a.m.
24 BY MR. BARR:
25 Q Just before we went off the record, Mr. Anderson, I

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1 had the Court Reporter mark a four-page document as an
2 exhibit – as Exhibit 707. Let me hand that to you know.
3 While you're looking that over, I'll hand copies to
4 Counsel and indicate this appears to be a form entitled
5 "Coal Tar Tank Coating Data Sheet." It appears to – it –
6 the name of the utility listed is San Bernardino Municipal
7 Water Department. It refers to SEB number 36-039, referring
8 to the Mountain Tank end of Sepulveda.
9 MR. JACOBSON: Mr. Barr, it's – are you the only
10 one – everybody is laughing at you –
11 THE WITNESS: I'm sorry.
12 MR. JACOBSON: – and I'll tell you why. You're
13 not from California. And it's "Sepulveda."
14 MR. BARR: Sepulveda.
15 MR. JACOBSON: Yes. Yes.
16 MR. BARR: Well, I took Spanish, and I believe my
17 pronunciation would be correct if they were following the
18 Spanish pronunciation."
19 THE WITNESS: You're probably right. That's
20 probably the gringo-ized version.
21 MR. BARR: I suspect. And I'm not sure that's
22 something to brag about.
23 MR. JACOBSON: Need a little levity late in the
24 afternoon.
25 THE WITNESS: I know it.

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1 MR. BARR: That's usually when we get the levity,
2 is late in the afternoon.
3 (Pause)
4 THE WITNESS: Oh, sorry.
5 BY MR. BARR:
6 Q That's okay. I – have you had an opportunity to
7 review the document?
8 A Yes.
9 Q Do you recognize the form that we've marked as Exhibit
10 707?
11 A Yes.
12 Q Is this a state form?
13 A It's a – what we used to call unofficial state forms.
14 It doesn't have a state form number. But is a form that
15 SEB, you know, designed for collecting data.
16 Q SEB, being Sanitary Engineering Branch.
17 A Correct.
18 Q The SEB number, 36-039, was that the unique number
19 assigned to San Bernardino Water Department?
20 A I assume it was from – I assume it's correct. That
21 was the kind of number everyone used.
22 Q Up at the top of the page above the typed – or printed
23 words "Coat Tar Tank Coating Data Sheet," there are some cc
24 indications.
25 The first question I'll ask is: Do you know whose

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1 handwriting that is?
2 A I'd say Bill Gedney's.
3 Q You worked with Mr. Gedney for a number of years, did
4 you not?
5 A Yes.
6 Q If you'd turn, please, to the third page of this
7 Exhibit 707, this appears to be a form of the California
8 Water Labs, Inc. –
9 A Yes.
10 Q – Company.
11 A Yes.
12 Q In Modesto, California.
13 At the bottom, there is a signature over a typed name.
14 The typed name reads "Jeff Harris."
15 Do you know who Jeff Harris is –
16 A No, I –
17 Q – or was?
18 A – don't.
19 Q At the top, after the word "purveyor," it says "City of
20 San Bernardino." And beneath that a couple of lines, it
21 says "Sample I.D."
22 A Yes.
23 Q And it says "Influent to MR tank when filling."
24 Do you have an understanding as to what that "Influent
25 to MR tank when filling" indicates?

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1 A No, I don't.
2 Q Do you have an understanding of the word "influent"?
3 A Yes.
4 Q What is "influent"?
5 A That means water going in. Inflow.
6 Q MR tank. Might that refer to Mountain Reservoir tank?
7 A It might.
8 Q Do you know of any other interpretations?
9 A Not in – not since it's attached to a form labeled
10 "Mountain Tank." But I don't know why they used that.
11 Q Okay. If you would turn, please, to the last page of
12 this exhibit.
13 A Yeah.
14 Q This appears to be a form – it appears to be a State
15 of California, Department of Health Services form. The name
16 of the form appears to be "Sample for Chemical Analysis."
17 A Correct.
18 Q Do you recognize this as a state form that –
19 A Yes.
20 Q – was in use at that time?
21 A Yes.
22 Q Turning back to the third page of this exhibit, the
23 California Water Labs, Inc., form.
24 A Yeah.
25 Q When it refers to "Sample I.D.," that line we were just

Page 9

1 discussing before, do you have an understanding as to what
2 "Sample I.D." refers to?
3 A It means the identification of a sample, information
4 that would let you interpret the results. And it means
5 where the sample was taken and, hopefully, precisely enough
6 that you can distinguish between, you know, where changes
7 might occur.
8 Q Okay. Is it – would it be your interpretation of the
9 "Influent to MR tank when filling" that the sample was taken
10 from water coming into the tank?
11 A Correct.
12 Q We talked a little while ago about the possibility of a
13 connection between PCE and TCE contamination in reservoir
14 water and TCE and PCE contamination in groundwater. If my
15 memory is right, you indicated that you were not aware of
16 any investigation of this possible connection.
17 Is that correct?
18 A That's correct.
19 Q By anyone.
20 A By anyone.
21 Q Would you agree that there is a possibility of a
22 connection between contaminated reservoir water and contami-
23 nated groundwater?
24 MR. JACOBSON: Objection. Lack of foundation.
25 ///

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1 BY MR. BARR:
2 Q Based on your experience.
3 If the answer is "I don't know" --
4 A From my experience, I don't know of any connection
5 between the two.
6 Q Do you have any opinion as to whether or not it is
7 possible that contaminated water in reservoirs eventually
8 found its way back into the groundwater?
9 A I would assume that it did in some cases.
10 Q That's not physically impossible, is that it?
11 A No. Not at all.
12 Q Did you ever have any kind of a discussion with anyone
13 as to the possibility that there was a connection between
14 reservoir water being contaminated and finding its way into
15 the groundwater?
16 A I don't recall any. In the time when these issues --
17 we were obviously aware of and concerned about groundwater
18 contamination. We worked closely with the water pollution
19 authorities, the water quality control boards, and the issue
20 about discharging water, water leaking in from reservoirs
21 never, to my recollection, came up, either because there
22 wasn't any physical connection or apparent connection.
23 Q So far as you know, that didn't occur to anyone at the
24 time.
25 A As far as I know, it did not. It wasn't raised as an

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1 issue, yeah.
2 MR. BARR: All right. Well, I'd say we've gone
3 the extra 15 minutes that we'd planned.
4 MR. JACOBSON: It also appears the air condition-
5 ing has shut down.
6 MR. BARR: That being the critical parameter,
7 unless there's an objection, why don't we adjourn for the
8 evening and resume tomorrow at 9:00.
9 (Whereupon the Deposition of Chester Anderson was
10 adjourned at 5:30 p.m. to reconvene on Friday, June 18, at
11 9:00 a.m.)
12 CHESTER E. ANDERSON
13 DATED:_____
14
15
16
17
18
19
20
21
22
23
24
25

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1 CERTIFICATE OF REPORTER
2 I, Nancy June Farley, a Certified Electronic Court
3 Reporter and Notary Public for the State of California, duly
4 appointed and commissioned to administer oaths do hereby
5 certify:
6 That I am a disinterested person herein; that the
7 witness, Chester E. Anderson, named in the foregoing deposi-
8 tion, was by me duly sworn to testify the truth, the whole
9 truth, and nothing but the truth; that the deposition was
10 reported electronically by me, Nancy June Farley, an Elec-
11 tronic Court Reporter of the State of California.
12 IN WITNESS WHEREOF, I have hereunto set my hand as
13 Certified Electronic Court Reporter and Notary Public on
14 this 22nd day of June, 1999.
15
16 NANCY JUNE FARLEY
17 CERT#00105
Notary Public 1195274
18 Expires: 9/29/02
19
20
21
22
23
24
25

Exhibit 99

IN THE UNITED STATES DISTRICT COURT

FOR THE CENTRAL DISTRICT OF CALIFORNIA

STATE OF CALIFORNIA, on behalf of the CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL, Plaintiff, vs. UNITED STATES OF AMERICA, DEPARTMENT OF THE ARMY, and DOES 1 - 100, inclusive, Defendants.	No. CV96-5205MRP(VAPx) No. CV96-8867MRP(VAPx) (Consolidated)
CITY OF SAN BERNARDINO MUNICIPAL WATER DEPARTMENT, Plaintiff, vs. UNITED STATES OF AMERICA, DEPARTMENT OF THE ARMY, and DOES 1 - 100, inclusive, Defendants.	

FRIDAY, JUNE 18, 1999

9:15 A.M.

---o0o---

DEPOSITION OF

CHESTER E. ANDERSON

VOLUME II

---o0o---

REPORTED BY: Nancy J. Palmer, Certified Electronic Court Reporter
Video/Audio Recording Services, Inc. - (916) 448-2457

COUNSEL

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Defendant's		Page
708	Three page document titled Special Bulletin	109
709	Multi-page document titled North San Bernardino - Muscoy Site Hazard Ranking Package State Toxics Bond Fund List	110
710	Multi-page document dated 8-14-86 on letterhead of Department of Health Services	118

BE IT REMEMBERED that pursuant to Notice and on Friday, the 18th day of June, 1999, commencing at the hour of 9:15 o'clock in the morning thereof, at the offices of the U.S. Attorney, 501 I Street, Suite 10-100, Sacramento, California, before me, Nancy Palmer, a Certified Electronic Court Reporter and Notary Public for the State of California, there personally appeared

—o0o—

CHESTER E. ANDERSON

called as a witness by the defendant, who, being by me first duly sworn, was thereupon examined and interrogated as hereinafter set forth.

—o0o—

LEWIS M. BARR, Esq., of the Environments and Natural Resources Division, Environmental Defense Section, 601 D Street, N.W., Room 8130, Washington, D.C. appeared as counsel on behalf of the defendant United States of America.

LISA H. CLAY, Esq., of U.S. Army Corps of Engineers, 1325 J Street, Sacramento, California, appeared as counsel on behalf of the defendant Department of the Army.

ANN RUSHTON, Esq., of the Department of Justice, State of California, 300 South Spring Street, Suite 500, Los Angeles, California, appeared on behalf of plaintiff State of California.

THOMAS N. JACOBSON, Esq., of Gresham, Savage, Nolan & Tilden, LLP, 600 N. Arrowhead Avenue, Suite 300, San Bernardino, California, appeared on behalf of plaintiff City of San Bernardino Municipal Water Department.

—o0o—

DEPOSITION OF

CHESTER E. ANDERSON, called as a witness by the defendant who, being first duly sworn by the Certified Electronic Court Reporter, a Notary Public for the State of California, to tell the truth, the whole truth, and nothing but the truth, testified as follows:

EXAMINATION

By LEWIS M. BARR, counsel on behalf of the defendant:

Q Good morning, Mr. Anderson, the continuation of your deposition from yesterday. Do you understand that the oath you took yesterday is still in effect today?

A Yes.

MR. BARR: Before we proceed, I wanted to address one item unrelated to the witness.

Mr. Jacobson, we discussed yesterday Mr. Harper and what I'm going to do is provide to you a copy, an OBD-3 form, a fact witness voucher, and as counsel, since you're counsel for Mr. Harper, if you would relay this to him and so he can be reimbursed in conformance with Rule 45.

MR. JACOBSON: Thank you, Mr. Barr. We'll do

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1 that.
2 BY MR. BARR:
3 Q Mr. Anderson, between the time we adjourned yesterday
4 and this morning, have you had any conversations with anyone
5 regarding the deposition?
6 A No. Well, an associate said, "How did it go?" And I
7 said, "I don't know." I mean that kind of a conversation.
8 Q Your associate was?
9 A Krista Clark.
10 Q How is she an associate of yours?
11 A She is a staff person for the Association of California
12 Water Agencies, somebody I work with all the time.
13 Q You indicated that after you had received the subpoena
14 in this case, you spoke to a Mr. Knoll?
15 A Yes.
16 Q I don't remember the first name.
17 A Norman.
18 Q Norman. And who is Mr. Knoll?
19 A He's the staff counsel for the Department of Health
20 Services.
21 Q And did you contact him or did he contact you?
22 A I contacted him.
23 Q And was this on the telephone?
24 A Yes.
25 Q Did you meet with Mr. Knoll?

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1 A No.
2 Q What was the nature of your conversation with Mr.
3 Knoll?
4 A I wondered if he was going to be here to represent me,
5 since he was the Department attorney, and since I was here
6 under the color of my office, with the years with the
7 Department, and I was just curious more than concerned. And
8 he indicated he would not be.
9 Q Did you discuss anything of substance in terms of the
10 subject of matter that might come up at the deposition with
11 Mr. Knoll?
12 A No. I – he – I told him what the case was. He was -
13 - he had no – indicated he had no, you know, specific
14 knowledge.
15 He wasn't with the Department at the time, back in
16 the eighties, so. Since he does represent Mr. Stone, or at
17 least he's still with the Department, he knew about his
18 appearance.
19 Q Have you been involved in other cases involving
20 Superfund, or the Superfund Statute?
21 A Yes, I have. Well, cases, and not so much litigation.
22 I've been involved in Superfund sites.
23 Q What Superfund sites have you been involved with?
24 A Well, most, the most involvement was with Stringfellow.
25 Obviously I had a lot of involvement with the Newmark site,

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1 because I essentially was responsible for getting it on the
2 State Superfund priority list back in 1980, or something.
3 Q Newmark, that's in San Bernardino?
4 A Yes. I don't know what the official name of it is,
5 what I call the Lockheed site in the Redlands area, I was
6 also very involved in that in the earlier days.
7 I've had peripheral involvements with the San
8 Gabriel Basin Superfund units. There's about three
9 different operable units. My involvement has not been very
10 extensive.
11 It was not during my time with the Department but
12 rather my time with Metropolitan, since those were all in
13 the Metropolitan service area, and our member agency or the
14 subagencies had, you know, impacts.
15 Similarly, I had that peripheral involvement with
16 the Burbank plight. I, again, I don't know the official
17 names of these things.
18 And others would have been, you know, peripheral
19 kinds of things. There was a site that Stringfellow waste
20 was hauled to for, until it was closed. I can't even
21 remember the name, but over near Pomona.
22 There were other sites in my region, you know, the
23 San Diego Orange that, some of which I don't make – I don't
24 have a clear distinction between those that are on, you
25 know, the transition. The site, there was ground water

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1 contamination, there's investigations, there's follow-up.
2 Sometimes they got on the State Superfund list. Sometimes
3 they got on the federal list.
4 It took EPA about 30 years for the San Bernardino
5 – I guess this is facetious. It took them a long time for
6 the Newmark site to get on the federal list.
7 Q Did you have any involvement in the San Bernardino site
8 getting onto the federal national priorities list?
9 A Not directly.
10 Q The involvement that you had with Stringfellow, with
11 Newmark, with Lockheed, was this in your capacity as a state
12 employee or in some other –
13 A Completely, completely. Well, the ones, the
14 Stringfellow, Newmark, Lockheed, were the ones in Los
15 Angeles County, were subsequent to my leaving the State when
16 I was with Metropolitan.
17 Q Did you ever give a deposition in any of these cases?
18 A No. Let me recall on Stringfellow, I never gave a
19 deposition. And I don't think I – I actually did a –
20 what's that other kind of a –
21 Q A declaration?
22 A A declaration. But I don't think that declaration was
23 ever finaled and used. I worked with the Attorney General's
24 Office and this was related to Stringfellow.
25 I might stress on Stringfellow, I was not ever in

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1 the toxics substance control division of the Department when
2 I was there or since it's been the Cal EPA.
3 So my job was never, you know, where I was
4 overseeing the Superfund site or the cleanup
5 My – in Stringfellow, my involvement was always
6 related to the drinking water, one way or the other.
7 Protecting the public health, people around it, related to
8 the drinking water supply.
9 Q Was that the nature of your involvement as well in the
10 Newmark and Lockheed matters?
11 A Yes. Although I would just differentiate on those and,
12 keeping in mind that the State Superfund Program was
13 embryonic in those days.
14 That the authority for the CERCLA, well, CERCLA I
15 think passed – I'm a little hazy on this but, and the
16 Department got that authority to help State Health from
17 their Water Quality Control Board. For example, in
18 Stringfellow, there was actually a transition of authority
19 there.
20 And in those early days, the Department's toxics
21 people, they weren't staffed up. They didn't have regional
22 offices.
23 And so in the Lockheed and Newmark sites when we,
24 our Department made the discovery of the contamination, you
25 know, began to track it, began to work with the utilities,

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1 and then there was this fund that we actually did the site
2 characterization. There was some early protocols that the
3 State used, you know, where is the site? Kind of the
4 general stuff.
5 We actually did those and submitted those with the
6 documentation, so that those sites would get attention
7 earlier on.
8 Q Focusing on the Newmark San Bernardino water supply
9 issues, are you aware of any meetings back in the first half
10 of the 1980s, between State personnel and City of San
11 Bernardino personnel, regarding VOCs in the San Bernardino
12 reservoir's waters?
13 A Well, there were – you're talking about in relative to
14 the tank coatings?
15 Q Correct.
16 A There were obviously staff, my staff, you know, had
17 meetings, contacts, made field inspections, took samples.
18 I'm sure there were meetings and discussions. I may have
19 been in some of those. I don't recall precisely, you know,
20 any particular meetings, but –
21 Q Aside from staff contacts, I guess your position at
22 that time would have been, I guess a level up from the
23 staff. Do you recall meeting with, I guess I'll just
24 characterize it as your equal numbers at the city level on
25 this issue?

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1 A I met with them. I was meeting, and again, the time
2 frame there was very much of an overlap as the documents
3 refresh my memory, that between the ground water
4 contamination discoveries and the first recognition of the
5 tank coating issues, I was in frequent contact and meetings
6 with people like Joe Stejskal was one, the person I probably
7 had the most contact with.
8 But Herb Wessel, I may have met with Bernie
9 Kersey, although I don't remember that specifically.
10 About the meetings that I know that we had or the
11 discussions, were about the ground water contamination, the
12 City moving ahead and building treatment facilities
13 proactively. Trying to get funding.
14 I wrote a contact. I had written and managed a
15 contract for providing people in the Stringfellow area with
16 hookups to the drinking water supply.
17 And because the State, in order for the State
18 Toxics Division to give the City money on the cleanup, they
19 had to write a contract and nobody over there knew how to do
20 it.
21 So I took the contract that I had prepared, you
22 know, went through, changed the – read all the boilerplate
23 stuff, change it around, gave it to Joe Stejskal.
24 You know, trying to get that, them in the
25 pipeline, get them on the priority list, get them to be able

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1 to get funding to do what needed to be done.
2 So we could basically pump and treat, specifically
3 at Newmark, or particularly initially, and stop the – first
4 of all, enable the city to provide safe water. You know,
5 not meeting or not exceeding the action levels, or MCLs, at
6 whatever time those came along.
7 Q The contract then would have been, that you assisted
8 with, would have been the City of San Bernardino and another
9 party?
10 A The Department.
11 Q It would have been between the State Health Department?
12 A Right, right. Which was again, it wasn't in my – the
13 contracting part was not in my jurisdiction. It was only
14 because I had this experience and was pushing to, you know,
15 get something done, that I even got involved in it.
16 Q Did a contract come into being?
17 A Yes.
18 Q And do you recall when that contract between the City
19 and the State was signed?
20 A I don't.
21 MR. BARR: Tom, I don't know if we've received a
22 copy of that contract. If it still exists, it's within the
23 scope of our discovery request. So we would request a copy.
24 BY MR. BARR:
25 Q Generally, is it your understanding this contract was

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1 entered into between the City and the State sometime in the
2 mid-1980s or late 1980s?
3 A My best recollection would be prior to 1985 but --
4 because that's when Diana Barich started in July as district
5 engineer, and assumed some more of the direct involvement
6 that I was -- had been carrying.
7 I had really been doing two jobs poorly for some
8 time, I mean I had had two jobs, filling two chairs in
9 effect for a year or so.
10 So I, that's my best guess. It was probably right
11 around that time or right before, but it could have been
12 after.
13 Q Okay. Did you ever have any contacts with anyone at a
14 company called URS?
15 A Yes.
16 Q With whom were you in contact?
17 A I do not remember the names. Mike -- no, I'm guessing
18 now. But I was trying to recall. I, if I -- if you tell me
19 a name, I'll remember if I remember it.
20 Q Sonnen, do you know that?
21 A Mike Sonnen, right. Is it Mike Sonnen?
22 Q I'm not sure.
23 A Okay. I think it was.
24 Q Do you remember the name Sonnen?
25 A Yeah.

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1 Q S-o-n-n-e-n?
2 A I think so.
3 Q Was this face-to-face or telephone conversations?
4 A Both.
5 Q Do you recall what was discussed with Mr. Sonnen?
6 A I know that -- and I'm sure it was Mike, if that's his
7 name, who was the staff person for URS. I had contacts with
8 the URS on different -- they did a big EIR for Norton Air
9 Force Base on a -- I think on the MX missile thing.
10 Something totally --
11 Q So, did you say EIR?
12 A Yeah. Environmental Impact Report.
13 Q Okay.
14 A So I had contacts with URS on different issues, totally
15 unrelated to this.
16 But I think that with Mike Sonnen, it was
17 primarily related to an investigation into the ground water
18 contamination related to San Bernardino sources.
19 I can't even remember who hired them, whether it
20 was the City or the Regional Board, or who they were
21 contracting to.
22 Q Did you ever provide any written documentation to URS?
23 A I'm sure we did, at least water quality data. I don't
24 recall other than that, but I'm sure we did.
25 Q Do you recall approximately when your telephone

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1 conversations, and was it one meeting or more than one
2 meeting with Mr. Sonnen?
3 A I don't recall any specifics. But I would venture that
4 we had multiple meetings and multiple phone conversations.
5 Q Approximately when, if you can put a year to it?
6 A No. I mean probably in that mid-eighties sometime.
7 Q Did you ever discuss with Mr. Sonnen the subject of the
8 reservoir tank coatings?
9 A To the best of my knowledge or recollection, I didn't.
10 I don't think I had any, on any water system.
11 Q Have you had any contacts with anyone from EPA
12 regarding the San Bernardino ground water issues?
13 A There may have been some contact in the early days. If
14 there was, I don't recall. I don't remember individuals.
15 And I may have met, had some peripheral contact in
16 my -- toward the end of my tenure with the Department.
17 In the last five years there were, remember that I
18 was in a regional role, and that the staff people were doing
19 the day-to-day thing, and the district engineer was
20 supervising them. I would see, if there was a memorandum or
21 something, I would see that.
22 But I really had very little involvement. I may
23 have met Kevin Meyer -- or Mayer at one time. His name,
24 it's about the only EPA name I know. But I know it because
25 I hear of and about him frequently on a contemporaneous

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1 basis --
2 Q When you say --
3 A -- on totally unrelated issues.
4 Q When you say on a contemporaneous basis, do you mean in
5 the present or?
6 A Yeah, present, recent past, related to things relative
7 to my involvement with Metropolitan. Totally unrelated to -
8 - in fact, unrelated to any Superfund activities in
9 California. It was a Nevada issue.
10 Q But so far as you can recall, it's possible that you
11 may have met Mr. Mayer in connection with the San Bernardino
12 matter?
13 A I may have met him. I may have been in a meeting with
14 him. I don't really recall that.
15 Q Okay. Were you ever interviewed by anyone from EPA
16 concerning San Bernardino?
17 A I don't recall that.
18 Q Then I take it you were never asked to sign a
19 statement, a written statement by EPA?
20 A I don't recall that or any --
21 Q Okay. I'm just looking for your best recollection.
22 A Right. I'm afraid to say no and then you're going to
23 hand me a piece of paper that shows I signed a statement. I
24 don't want to be embarrassed.
25 Q Okay. No, we don't -- I don't have one.

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1 A I didn't think so.
2 MR. BARR: All right. We left off yesterday with
3 Exhibit 707.
4 The next in order is 708. I'd like the court
5 reporter to mark as Exhibit 708, a three page document on
6 Harper & Associates, Incorporated letterhead. It does not
7 bear a date but it does appear to bear a date stamp,
8 December. The date is unclear, 1984. Special Bulletin is
9 the title of the document.
10 BY MR. BARR:
11 Q Mr. Anderson, let me hand you what we have had marked
12 here as Exhibit 708 and I'd ask you to please review that.
13 (Pause, reviewing document)
14 A Okay.
15 Q Is this a document you recall having seen before today?
16 A It appears, after looking at it, somewhat familiar.
17 But I don't really recall it.
18 Q There's some handwritten notes on pages 2 and 3. Do
19 you recognize the handwriting?
20 A Yes.
21 Q Whose handwriting is that?
22 A Bill Gedney's. I mean that's my best guess.
23 Q It refers on page 2 at the bottom where it says
24 "Reasonable Assumption: PCE was introduced by the
25 Contractor in thinner used to thin coating materials at

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1 jobsite." And it appears that Mr. Gedney wrote, "Both" and
2 the word Both is underlined, "contractors actually admitted
3 to the utilities that they had done this."
4 Do you recall that problem coming up from time to
5 time, of contractors doing that sort of thing?
6 A I, having seen this, it – I obviously was aware of
7 that. But I hadn't recalled that until I looked at this.
8 Q Does that remind you that that did happen from time to
9 time?
10 A Only by reading this do I recall that.
11 MR. BARR: Okay. As Exhibit 709, I'd like the
12 court reporter to mark a multi-page document. I don't have
13 extra copies, counsel. It's a rather thick document. It
14 was difficult to reproduce.
15 For the record, this will be Exhibit 709. It's
16 titled North San Bernardino - Muscoy Site Hazard Ranking
17 Package, State Toxics Bond Fund List. Document
18 identification numbers CITY01314 through 1374.
19 MR. JACOBSON: May I take a look at it?
20 MR. BARR: Sure. Off the record.
21 (Off the record to review document.)
22 MS. RUSHTON: On a break we can get copies made?
23 MR. BARR: I don't know. You know, this is not my
24 office. I don't know what their facilities are. I know
25 you'll be able to get a copy with the transcript for sure.

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1 BY MR. BARR:
2 Q Mr. Anderson, we're back on the record. Would you
3 please review what we've had marked as Exhibit 709.
4 A I assume you don't want me to look through all the
5 graphs and stuff.
6 Q Yeah, I don't. That's not necessary.
7 A I know what, sort of what's in there.
8 Q Do you recognize what this document is?
9 A Yes.
10 Q And what is it?
11 A Well, it's a package that was put together to get the
12 North San Bernardino - Muscoy Site on the State Toxics Bond
13 Fund List, as is indicated. It's what they called a hazard
14 ranking thing, a site evaluation.
15 Q And were you involved in preparing this document?
16 A I think I prepared it, obviously with input and help
17 from others, in terms of the detailed data. In fact I –
18 Q Did you work on this with anyone else from the
19 Department of Health Services?
20 A It says here that W.C. Gedney and I was sure that he
21 had worked on it with me.
22 Q Do you recall anyone else from the Department of Health
23 Services working on it?
24 A Not directly. Jeff Stone could have had some
25 involvement. But Jeff, the City of San Bernardino Water

Page 1

1 System was assigned to Bill, and Jeff's involvement would
2 have been incidental.
3 And at that time, it was prior to Diana Barich
4 starting as district engineer, so she wouldn't have been
5 involved at that time.
6 Q On the second page of the exhibit, I think for
7 consistency, I'll refer to the document identification
8 production numbers down in the lower right corner, page
9 1315. It says "Name of Reviewer: C. E. Anderson." Is that
10 you?
11 A Yes.
12 Q And what was the – I believe you indicated that one of
13 the purposes of the document was to secure a listing of the
14 site on the State Toxics Bond Fund List. Were there any
15 other purposes related to that?
16 A No, I don't think so. The – most of the data, I have
17 to look at it, but most of the data was prepared or
18 available for other reasons. You know, just part of our
19 tracking, or the City's tracking of the problem, and
20 obviously well logs and that kind of thing.
21 But the form itself and the checklists were
22 specifically for the California Superfund. The bond, you
23 know, funding list. And it was the only way the City could
24 get any funding was to get on that list and so this was the
25 route.

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1 Q On this page that we were just looking at 1315, it
2 refers to "an old, abandoned small-plane airport." Do you
3 recall obtaining any information as to who had operated that
4 airport?
5 A Very remotely. We really didn't do much in-depth
6 investigation. That wasn't our responsibility for, you
7 know, determining source information that we had or
8 received, was more second-hand from probably City folks, or
9 their consultants or their Regional Board. And, you know,
10 very little documentation.
11 I think there was, the City may have been involved
12 or there was a suggestion the City may have been involved in
13 the ownership, but I'm not sure about that.
14 Q If you would turn to the page with the production
15 number 1322 at the bottom. There is a subject and I take it
16 this is all part of the State checklist or State form?
17 A Yes.
18 Q There's a section relating to "Permeability of
19 Unsaturated Zone." Do you have an understanding as to what
20 the unsaturated zone means?
21 A Yes.
22 Q What is that?
23 A It's basically the part of the aquifer from the
24 surface, proceeding down and where the water, there's
25 usually no standing water, no water perched or existing.

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1 It doesn't mean there isn't any moisture. It's
2 just that it's not part of that water table.
3 Q And do you recall where you developed or how you
4 obtained the information that's listed in that section?
5 A Primarily from well logs I'm sure. I don't know what
6 these references are. But that would have been the normal
7 source information, unless there is some more detailed
8 hydrogeologic study, which I don't recall at that time there
9 being.
10 Q Now the references you mentioned, are those those
11 letters on the very left-hand margin?
12 A Yes.
13 Q F,G,J.
14 A I -- right. I guess that's what.
15 Q I'm assuming it's an F.
16 A Yeah.
17 Q It's cut off on this. It's slightly cut off on the
18 copy that we have here.
19 If you would turn please to the page with the
20 production identification number 1353, this is an oversized
21 sheet. Do you know if there is a particular name for this
22 kind of a document?
23 A I think there is. I can't think of the terminology
24 that's used. It's basically a graph of the -- I think this
25 -- well, it's not -- this is not clear. But it's probably

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1 the water level in a well and it's probably the static
2 level. Although you never can be certain unless there is a
3 -- you know the person that was doing it or there is a clear
4 record.
5 Well, in fact, I can see notes now on the left-
6 hand side. A number of the levels were taken when the well
7 was pumping, which means the water level would be lower.
8 These graphs would have been something that was
9 not prepared by the Department.
10 They probably were obtained from the City Water
11 Department who kept, you know, very excellent records on
12 this kind of thing.
13 Q If you would turn to the last page of this exhibit.
14 A It's a map.
15 Q Yeah. The map of the -- the photocopying partially cut
16 off the number but I think it's still legible as 1374. Is
17 that a map that the State would have prepared or obtained
18 from another source?
19 A No. This was not prepared by us and it was obviously
20 prepared by Gary Rasmussen & Associates. And they were a
21 reputable ground water hydrology firm. I had forgotten
22 that, you know, that that work had been done by the time we
23 did this. I think they had done work for the City.
24 Q You're referring to the Gary S. Rasmussen & Associates,
25 Inc.?

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1 A Right.
2 Q Project No. 2146.
3 A Right.
4 Q Do you have an understanding of on this legend it says,
5 "dashed where leaky barrier"? Do you know what that refers
6 to?
7 A Yes.
8 Q What does that refer to, dashed where leaky barrier?
9 A Well, it's there are barriers in the groundwater
10 movement scenarios, are something that keeps the groundwater
11 from moving. Frequently it's a fault of some kind.
12 But where the -- there appears to be water that
13 moves through that barrier, they use that reference as it
14 leaking. Meaning that it's the permeability or the
15 transmissivity of the water or of the material is less than
16 the aquifer itself. But it isn't totally retarded, so.
17 Q Underneath that it says, dotted where postulated
18 barrier. Do you have an understanding of what that means?
19 A That means that the groundwater geologist to the best
20 of my knowledge, that means that they, you know, didn't have
21 enough data, could not be absolutely sure.
22 But they basically postulated that there that
23 barrier went in that direction along that line.
24 Q So it was their best estimate?
25 A Yes.

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1 Q On the second page of this exhibit, page marked 1315
2 next to your typed name, C. E. Anderson, SEB, CDHS, there's
3 a date April 20, 1985. What did that date represent?
4 A I presume it was the date when that form was typed.
5 Maybe when I actually prepared it but I'm sure it was
6 prepared and typed in a fairly close time frame.
7 Q So this would have been at the completion of the work
8 that you did?
9 A Yes.
10 Q And if I'm understanding you correctly, you were
11 essentially responsible for the preparation of Exhibit 709?
12 A As I indicated before, the form, probably all the data
13 was, you know, assembled by the City, obtained from the
14 City, taken from our files. Probably Bill Gedney did a lot
15 of that work. Bill probably contributed to, there isn't a
16 lot of verbiage in here. The --
17 Q You said there is not a lot of verbiage?
18 A There is not a lot of verbiage in this assessment
19 thing. You know, they're little short choppy things.
20 The numbers are written in my handwriting, so I
21 obviously put those in.
22 I might stress that, just when I recall it, this
23 was really very early on in any investigation that was done
24 into this site as far as cause or source. So any comments
25 that were made were best guess, you know, that what we knew

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1 at the time. And that's all that the Department, the Toxics
2 Division, required. Was that we give them the best
3 information that was available.
4 MR. BARR: Okay. I'd like to have the court
5 reporter mark as Exhibit 710, a multi-page document dated
6 August 14, 1986, on the letterhead of State of California,
7 Health and Welfare Agency, Department of Health Services.
8 BY MR. BARR:
9 Q Now, Mr. Anderson, let me hand this to you, what we've
10 marked as Exhibit 710. Now while you're doing that, I note
11 for the record it bears a document identification production
12 number CITY 05-0214 through 223.
13 (Pause, reviewing document)
14 A Okay.
15 Q Having reviewed what we've marked as Exhibit 710, Mr.
16 Anderson, do you recall having seen it before today?
17 A Yes.
18 Q You are indicated as a blind carbon copy recipient.
19 A Right.
20 Q On page 3 of the, what's titled Permit Amendment.
21 A Right.
22 Q The Diana Barich, B-a-r-i-c-h, is that the individual
23 you mentioned yesterday as well as today?
24 A Yes. She was the district engineer at that time.
25 Q As of August of 1986, were you then a regional

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1 engineer?
2 A Yes.
3 Q If you would turn, attached to the Permit Amendment
4 document, which was signed Peter A. Rogers, there is the
5 Engineering Report.
6 A Yes.
7 Q Dated July 21, 1986. And it indicates, I believe it
8 was prepared by W. C. Gedney. Is that the Bill Gedney we've
9 been discussing?
10 A Yes.
11 Q Is this engineer report something you would have
12 reviewed before -- well, before it was finalized?
13 A Yes. As well as the permit amendment documents, you
14 know, the procedure was staff engineer prepared a draft,
15 district engineer reviewed, changes were made as
16 appropriate. The regional engineer reviewed and approved,
17 it went to the chief and for permit.
18 Q So it would have gone through Mr. Gedney, Ms. Barich,
19 yourself, before it went to Mr. Rogers?
20 A Correct.
21 Q On the first page of the engineering report, the second
22 paragraph, there's some discussions of the trichloroethene
23 and perchloroethene.
24 A Yes.
25 Q Is that a mistake? Should that be trichloroethylene

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1 and perchloroethylene?
2 A Of course it's not a mistake, as Bill prepared it and I
3 approved it. It's that's another accepted name in organic
4 chemistry, less commonly used. But it is the same compound,
5 perchloroethylene, perchloroethene.
6 Q All right. I appreciate your clearing that up for
7 someone who has no background in organic chemistry.
8 It refers to concentrations in the wells,
9 beginning in July 1980, and coming up to the present, I
10 guess which would have then been 1986.
11 A Right.
12 Q It indicates, if I can summarize, that the
13 concentrations of both chemicals, the range of levels
14 increased from 1980 to 1986.
15 Do you recall whether any significance was
16 attached to the fact that the levels were increasing over
17 time?
18 A Yes.
19 Q Well, were any conclusions drawn from that?
20 A There were suppositions or hypothesis made that there
21 was a plume or because this was kind of beginning to be
22 understood better by everybody. Not just in this area but
23 in other situations. That the rate of movement of many
24 organic contaminants differed from the rate of water
25 movement.

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1 That there was, frequently they were retarded, and
2 that rate of retardation was a function of the kind of soil,
3 matrix, both vertically and then in horizontal.
4 But that in general, there was just a feeling that
5 the plume wherever it had started and was, had moved and had
6 increased.
7 The data was never -- you know, there was
8 variations up and down. And it was always assumed that the
9 pumping operations, which varied between wells at different
10 times of the year, would have affected that.
11 Q Do you recall any documents being prepared which
12 addressed this issue of the increase in concentration over
13 time?
14 A I don't recall specific documents. There were
15 discussions. It wouldn't surprise me if there were
16 documents, varying from the cities, to consultants, to Water
17 Quality Control Board, to maybe even something from the
18 Department.
19 MR. BARR: All right. What I'd like to do is take
20 a short break. I'd like to review my notes. I may have a
21 couple of follow-up questions and I believe that counsel for
22 the City or the State may have some questions for you.
23 THE WITNESS: Okay.
24 (Recess from 10:05 to 10:20 p.m.)
25 MR. JACOBSON: Mr. Barr, are you finished right

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1 now?
2 MR. BARR: No. No, I have a couple of more
3 follow-up.
4 MR. JACOBSON: Okay.
5 BY MR. BARR:
6 Q Mr. Anderson, have you discussed either today or
7 yesterday with Mr. Jacobson the subjects or any or the
8 subjects that we've talked about during your questioning?
9 A No.
10 Q In the course of your work with the State, was it part
11 of your responsibilities to inspect any municipal reservoir
12 interiors?
13 A Yes.
14 Q Which, do you recall if you inspected any reservoir
15 interiors within the City of San Bernardino?
16 A Yes.
17 Q Do you recall when that you would have done that?
18 A No, and I really don't.
19 Q What was the purpose of your inspection?
20 A This, my specific recall, and I might add that I may
21 have, you know, looked inside, been inside other reservoirs
22 that I just don't recall. But there was one reservoir that
23 was the -- it was a concrete reservoir with a, you know, a
24 wooden superstructure and a metal roof.
25 And that it was the subject of concern of a

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1 vandalism, where somebody gained access and was actually
2 occupying. You know, there was a ledge, if you will, inside
3 the reservoir.
4 But it was, the reservoir was not empty at the
5 time. I mean it was full or essentially full at the time.
6 Q Okay. In the course of your -- did you do any other
7 reservoir inspections?
8 A For other water systems?
9 Q Yes.
10 A Hundreds.
11 Q At the time of your inspections were these reservoirs
12 empty or full?
13 A Well, generally they were full. And then the
14 Department did and still does make routine inspections,
15 full, what we call annual inspections, or surprise visits
16 sometimes, or special purpose.
17 And we would climb to the tops of the reservoirs,
18 and inspect the -- really looking for maintenance and
19 access.
20 And would generally look in the hatches, sometimes
21 go down the stairs, and depending on the water level, and
22 look at the condition of the coating. Just a superficial
23 inspection really, as far as the structure or the coatings
24 were concerned.
25 Q Well, were you looking at the nature of the coatings or

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1 their integrity or for something else?
2 A Generally, integrity in a very general sense, because
3 you may see very little of it and the part you could see
4 wasn't usually the area that had problems anyway. But
5 the --
6 Q Because of the water level?
7 A Right. And we were looking for really any indication,
8 was there external contamination, was there any rodents
9 floating around on top, scum, that kind of thing.
10 Q Did you in the course of your work for the State ever
11 observe any reservoir coating application procedures in
12 progress?
13 A Yes. I was at the site of several, particularly
14 related to the issues of tank coatings and volatiles and
15 where the system was doing a follow-up. I went out to some
16 sites just to learn more about the process of what went on,
17 that kind of thing.
18 I can't recall if I was actually there when they
19 were actually doing it. I don't think I was. I don't think
20 I ever actually observed that.
21 Q Did you make any inspections of the reservoir coating
22 work after it was done and before the reservoir was filled?
23 A In a very limited number of cases, again kind of in
24 that same time frame, for that kind of same reason, getting
25 a better understanding. I did go look at some.

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1 Q Were any of the reservoirs that you looked at in the
2 San Bernardino area?
3 A Well, in the San Bernardino area?
4 Q Well, within the City of San Bernardino water system.
5 A I don't recall. I don't recall actually being inside.
6 I kind of remember one tank that had been either recently
7 built and/or recently coated or both and being in that
8 vicinity. But I can't remember even being inside that.
9 At that time that wouldn't have been my normal
10 function to have done that.
11 Q That wasn't part of your job responsibility?
12 A Right. It was part of my staff's job and since it was
13 usually very hot, I would have preferred to have them go on
14 doing this.
15 Q All right. So you would have supervised those who did
16 these kind of inspections we've been talking about today.
17 A Right, right. But the Department neither had the
18 staff, nor the expertise to do the kind of technical
19 inspections of tank coatings. Didn't have the equipment.
20 Basically didn't have the expertise, that's you know, a very
21 specialized area, that you have to have devices to measure
22 that, and detect holidays and all that kind of thing, so.
23 MR. BARR: Okay. Mr. Anderson, I think that's all
24 the questions I have for you right now.
25 I think the other attorneys may have some

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1 questions for you.
2 THE WITNESS: Okay.
3 EXAMINATION
4 By THOMAS N. JACOBSON, counsel for City of San Bernardino
5 Municipal Water Department:
6 Q Mr. Anderson, they've decided that I get to go first.
7 Even though I guess you and I knew each other for many years
8 in San Bernardino, we never had any discussions about the
9 Newmark site or any of the City of San Bernardino Water
10 Department facilities prior to this deposition. Is that
11 right?
12 A That's correct.
13 Q During the early 1980s, what was the responsibility of
14 your office?
15 A The primary function was to the oversight, regulatory
16 oversight of all large, meaning greater than 200 service
17 connections, public water systems in the San Bernardino
18 District, which included all of the two largest counties in
19 the world, San Bernardino, Inyo and then Mono Counties.
20 I think I said Alpine earlier. There was a –
21 that had previously been in my district but I think by the
22 eighties, it was no longer. It had been detached and moved
23 to another district.
24 But that, regulatory oversight, was to basically
25 inspect, review water quality, respond to water quality

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1 problems, issues, consumer complaints, if there were any
2 kind of a disease outbreak that could have been, permits,
3 reports and the whole, the whole gambit.
4 Q And in the three-county area, approximately how many
5 different water purveyors did you have in the early 1980s?
6 A To the best of my recollection it was about 125.
7 Q And they ranged in size from very large systems, like
8 the City of San Bernardino, to fairly small systems in Mono
9 and Inyo County?
10 A Exactly.
11 Q Now was your department also concerned with the quality
12 of water that came from the well? That is to say, as water
13 is taken from the well and pumped to a storage reservoir,
14 were you – was your office concerned with the quality of
15 that water?
16 A Absolutely.
17 Q Did your office have a regular program of testing well
18 site water?
19 A I would say no. That the regulatory program for
20 drinking water systems in California has been essentially a
21 self-monitoring program.
22 It's pretty similar for waste water discharges and
23 it's pretty true of all states, that because of the huge
24 mass of analyses that are required, that the water utility
25 bears that responsibility and has all the, you know,

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1 responsibility incumbent for accuracy, truthfulness, in
2 reporting.
3 And the Department did check sampling, which meant
4 that we would go out and take a sample now and then. We
5 never were able to do enough, as much as we would have liked
6 to.
7 And then we did special samples, special studies.
8 The Four Basin Study that was alluded to before, is an
9 example.
10 Q So the responsibility, the primary responsibility at
11 least for determining whether or not a particular well had
12 contaminants in excess of what's now known as the MCL, that
13 would have even in the early eighties, been the
14 responsibility of that water purveyor that owned the well?
15 A Yes. Clearly the law places the direct responsibility
16 on the purveyor. The public water system, the Department
17 has the oversight responsibility, so.
18 Q And were there instances in the early 1980s when a
19 purveyor made your office aware of some problems vis-a-vis
20 contaminants?
21 A Yes.
22 Q Arising from well sources?
23 A Yes.
24 Q And during the early 1980s, do you recall being made
25 aware of a problem in some of the wells that were within the

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1 jurisdiction of the San Bernardino Municipal Water
2 Department?
3 A Yes. Some of the very initial findings of a select
4 group of wells, relating to the volatile organics were, came
5 out of that Four Basin Study, which was sampling done by the
6 Department.
7 But from then on, many of the tests were done on
8 other wells and when that, if there were findings, those
9 were -- the City made those known to us.
10 Q I assume there came a point in time in the early 1980s
11 when your office became aware of the fact that some of the
12 wells in the area of the San Bernardino Municipal Water
13 Department's jurisdiction, contained levels of contaminants
14 in excess of the action level for TCE and PCE?
15 A Yes.
16 Q And once your office became aware of it, did you ever
17 have any cooperation problems with the City of San
18 Bernardino in connection with dealing with those
19 contaminants?
20 A There were none that I recall. In fact, they were
21 extremely cooperative. Very aggressive in addressing issues
22 and very proactive.
23 Q Now the relationship that would exist between your
24 office and that of a water purveyor, was it such that you
25 literally had enforcement powers to direct a water purveyor

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1 to do something that you would request to be done?
2 A Absolutely. Those, and those enforcement authorities
3 were strengthened by a change in the Health & Safety Code
4 and I don't remember those dates. But we always, and I say
5 always, the Bureau of Sanitary Engineering originated in
6 1915 and they had the authority to permit water systems.
7 And I think we always had a very strong but very broad
8 generic authority to direct a water purveyor to do something
9 to assure the water was pure, wholesome and potable.
10 We later got, and I don't -- probably in the mid-
11 eighties someplace, we got authority to issue citations,
12 compliance orders, and there's some other legal actions that
13 were --
14 Q Did you believe in the early 1980s that your Department
15 had the right by way of example to tell a water purveyor to
16 take off a coating, an interior coating of a steel reservoir
17 and replace it with another coating?
18 A That was -- that authority wasn't clear and we, that we
19 didn't do that, that there was question on our authority in
20 terms of the specifics.
21 That was, in other words, we could direct the
22 water utility not to serve water if it exceeded a standard.
23 Or we could direct them to take some corrective action, but
24 that precise corrective action would have probably been
25 outside our jurisdiction. We didn't do it and I know that

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1 was a gray area as to what we could do.
2 Q Okay. So, just by way of example, I know you had some
3 problems with the Riverside Highlands tank on Van Buren
4 A I remember one tank of Riverside Highlands.
5 Q Yes. In that case, even in that case did you believe
6 that you had the authority to tell them that they had to
7 take all the coating off and start all over again?
8 MR. BARR: Objection, asked and answered.
9 BY MR. JACOBSON:
10 Q You can answer it.
11 A I don't believe we -- we felt we had the clear
12 authority to tell them they had to take the coating off and
13 start over.
14 We may have given them the strong signal that we
15 felt that's what they had to do. And frequently just the,
16 again, the aura of the Health Department, the health
17 authority, would cause water purveyors to do what we thought
18 was the right thing, even though we didn't order them and
19 maybe didn't have the authority to do so.
20 I think what's clear is that we made it clear to
21 water purveyors that if they served the water, if they
22 proceeded with a tank that was problematical and then the
23 water in the tank had high levels of something, that there
24 were consequences for them. That that would be unacceptable
25 to the Department.

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1 Q Okay. Now at any point in time, did you ever become
2 personally aware of a tank that was owned and operated by
3 the City of San Bernardino Municipal Water Department, that
4 had any kind of a contaminant leaching from the coating into
5 the water system?
6 A My -- I don't recall. I, frankly, I thought I saw some
7 reference to something in one of these documents. But I
8 didn't remember it before then and I don't even recall right
9 now which tank it was or if that's what I read.
10 Q All right. Going beyond the City of San Bernardino
11 Municipal Water Department, it's quite obvious from your
12 testimony that you did have some experience in connection
13 with the issue of PCE leaching into the water system from
14 various tanks throughout the State of California. Is that
15 correct?
16 A Various organics, probably PCE. Yes, definitely PCE,
17 right, and maybe some other things.
18 Q Okay.
19 A Yes, definitely.
20 Q In any of those cases, was there ever -- did any of
21 those -- let me rephrase the question.
22 In any of those cases, do you recall a groundwater
23 contamination problem being attributed the PCE that leached
24 from the coatings into the tank system?
25 A No.

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1 Q Now yesterday you were asked a question about what was
2 described as a nexus between the PCE, which may have leached
3 out of water tanks and into the water system, and ground
4 water. Can you recall at all why there was -- there would
5 have been no discussion or no action taken with regard to a
6 leaching process being the possible source of what's been
7 called the Newmark Superfund site?
8 A Is your question that, do I recall why there wasn't a
9 discussion?
10 Q Yes.
11 A I think that there wasn't any strong indication that
12 there were tank coating -- tanks with coating problems or
13 coating issues in the vicinity or directly upstream of sites
14 where there was groundwater contamination.
15 That levels and the volumes of water would not
16 have, if we had looked at that, they probably wouldn't have
17 brought to our mind that it was that this was going to be a
18 serious problem for a large aquifer.
19 I mean, or not that there couldn't be some
20 transference, but that it wouldn't create the mass of
21 contaminant, if you will.
22 I'm trying to think. I guess that even if there
23 had been contaminant leaching from the reservoir into the
24 water, that that water would not, for the most part, unless
25 it was recognized and stopped, and then emptied, that water

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1 wouldn't have been, you know, eliminated from the tank in
2 large volume at that point.
3 It would have been essentially served through the
4 system, if it was an unknown, if you will. If this had
5 been, occurred, you know, had occurred in other times, it
6 would have basically been distributed to the customers and
7 ended up either, you know, as irrigation water or in the
8 sewer systems.
9 Q Okay. You also yesterday made some reference to some
10 of the pipes that were in the San Bernardino system as
11 being, containing a coating, a possible coal tar coating.
12 And I believe it was also a cold applied coal tar coating.
13 Do you recall that testimony?
14 A I don't recall testifying or about specific pipes in
15 the, you know, in the city system. I know that was, it's a
16 piping material that was used in the industry. It wasn't
17 uncommon.
18 I don't think I have any direct recollection of
19 the piping in the City of San Bernardino system.
20 Q Okay. So, my next question would be, is whether you
21 know if any of the coating that was used in the San
22 Bernardino system, contained PCE as either a cut-back
23 solvent or as a thinner in the process of putting the
24 coating inside the pipe?
25 A I don't know.

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1 Q We've also had some discussion here about the
2 application of coatings to the inside of tanks. Was it the
3 policy of your office to have someone, such as Bill Gedney
4 or yourself, present during the application process of
5 coating materials?
6 A No.
7 Q If Mr. Gedney happened to come upon a tank that was
8 being serviced or applied with this, any kind of a coating,
9 whether it be the cold applied or the hot applied, would it
10 be his responsibility to then continue to check up on that
11 process until it was completed? Or would he just be making
12 a random call?
13 A Well, I think that it would depend on the time frame.
14 If, you know, before the issue of tank coatings came up,
15 that it probably would have been not of great interest.
16 Other than the fact that, you know, application of tank
17 coating material was considered a very positive thing,
18 because it was protecting from rust and the growth of
19 bacteria and stuff like that.
20 But after the issue came up, as I indicated, I
21 made a special effort a couple of times to go look at sites
22 where there was a coating job. I'm sure that Bill Gedney
23 and various staff of the Department in other parts, probably
24 wanted to increase their knowledge.
25 It was not an area that we -- that was our

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1 specialty, that we had any great knowledge about.
2 Q Let me digress a little bit. We've talked in very
3 small terms about this, the Newmark Superfund site. At any
4 time during the time that you were working for the State of
5 California, did you participate in any committees that were
6 either addressing, or discussing, or in any way dealing with
7 the Newmark Superfund site?
8 A No committee that I recall. I know there were some,
9 there were meetings. Again, with the principals, the City,
10 the Water Quality Control Board, who really had the lead on
11 pollution, preventing pollution contamination of State water
12 resources. Their consultants at some point, the toxics
13 department started to be involved, our people.
14 I'm sure there were meetings but I don't think
15 there were -- I think the committee thing got started after
16 EPA got involved. That was more a part of their formal
17 procedure. But that's my recollection.
18 Q Were you involved in anyway in EPA's formal procedure?
19 A I don't think I was. I, again, I had changed my role
20 and had a much broader area of responsibility. But I
21 probably saw documents on meetings and stuff, you know, had
22 discussions with staff, much -- I was just much less focused
23 on it.
24 Q You did, if I recall though, try to assist the City of
25 San Bernardino in having the site put on the State Superfund

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1 list and obtain State funds. Is that right?
2 A That's correct.
3 Q Okay. And how did you get involved in that process?
4 A Well, again, we were with the Department of Health
5 Services, the Drinking Water Program, Sanitary Engineering
6 Branch at the time and that we, that was our focus was the
7 drinking water supply.
8 The fact that any water supplier had ground water
9 contamination, trying to get a solution to that in terms of
10 preventing the service of that water, that was our number
11 one focus.
12 That if utilities could have simply not used, you
13 know, abandoned those sources and gone to something else,
14 that would have been, really probably removed us more from
15 the scene. And put it more just as a ground water
16 contamination problem.
17 But it was a desire to both, you know, to correct
18 the problems so that the contaminants wouldn't get into the
19 drinking water supply being served; but also to, you know,
20 help prevent the movement.
21 There was a perception and a knowledge of the
22 groundwater basin, that the more that that plume as it was
23 understood, moved, the more sources that would become
24 contaminated potentially. Involving not just the City but -
25 - the City of San Bernardino, but the City of Riverside, who

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1 had a large number of wells to the south.
2 So, and I just, partly I had the bureaucracy. I
3 understood the bureaucracy. I knew how to make things
4 happen. I mean, and I knew that it wasn't going to happen,
5 unless somebody took action basically.
6 And the City was very proactive. It had already
7 started studies and actions. The permit that was referred
8 to was one of the first for a treatment facility in the
9 State of California, for a treatment for removing
10 contaminants, at what wasn't even a Superfund site until
11 later.
12 Q Now after the wells of the Newmark area were identified
13 as having contaminants in excess of the action level and
14 later the MCL, do you know if the City of San Bernardino
15 used those wells without treatment, such as in a blending
16 situation, or at all?
17 A I'm sorry. Would you repeat the question?
18 Q Yes. After the sites in the Newmark area, various
19 wells had been identified as having contaminants in excess
20 of the action levels or the MCLs, do you know if those wells
21 were used for domestic water?
22 A My recollection is that they were. And limiting to the
23 Newmark site, that they were used but they were operated in
24 a manner that they were blended.
25 The City could manipulate the piping arrangement

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1 and some of the wells had much lower than action levels and
2 some were higher. And they would stage and operate those.
3 And I, to my knowledge, I think that the operation
4 was designed and I think we understood it to be such that
5 they didn't serve water exceeding the action level.
6 Q Did you ever hear of a situation in San Bernardino
7 where allegedly the coating material that was used on the
8 inside of the tank, be it cold applied or hot applied, had
9 been applied too thick?
10 A I don't recall of any such report or occasion.
11 Q In following the test of a water tank, such as one in
12 San Bernardino, where the test had disclosed that inside the
13 water tank, levels of contaminants of PCE in particular,
14 were above action levels or MCL levels, do you have any
15 specific knowledge of a tank in the San Bernardino Municipal
16 Water District's jurisdiction being where the water was
17 specifically discharged into a specific area, that'd be a
18 sewer, a storm drain, or onto the ground?
19 A I don't have any specific knowledge of that occurring.
20 Q Okay. Now there was some mention yesterday about the
21 problem with the Riverside Highlands District and the Van
22 Buren tank.
23 A Yes.
24 Q Can you give us an approximation as to the distance
25 between this tank that was of concern in the Riverside area,

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1 and that of say the location of 40th and Waterman, which is
2 where the Newmark plume is located?
3 A Probably it was roughly eight miles, could be ten.
4 Q And based on your knowledge, is that tank up-gradient
5 or down-gradient from the Newmark plume?
6 A Way down-gradient.
7 Q Do you know of any way that water discharged from that
8 tank could enter the area of the Newmark plume?
9 MR. BARR: I'm going to object. The witness has
10 testified he is not a hydrologist or hydrogeologist.
11 There's no basis for the question.
12 BY MR. JACOBSON:
13 Q You can answer the question anyway.
14 A The question was is there -- do I know of any way it
15 could get there?
16 Q Yes.
17 A Without being facetious and talking about putting in a
18 tank truck and hauling it up there, I know of no possible
19 way.
20 Q Okay. You were shown an exhibit yesterday, Exhibit
21 706.
22 MR. JACOBSON: Do we have yesterday's exhibits?
23 MR. BARR: Yes.
24 BY MR. JACOBSON:
25 Q Now the date of Exhibit 706 is November 1984. Do you

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1 agree with me on that?
2 A Yes.
3 Q All right. And in this particular memo, it appears
4 that Mr. Stone is attempting to document a problem with the
5 Riverside Highland Water Company's tank. Is that correct?
6 A That's correct.
7 Q Were you aware that prior to November 21, 1984, that
8 the three main manufacturers of coatings, that is to say
9 Koppers, Engard and Tnemec, had eliminated PCE as an
10 ingredient in their thinners?
11 A I --
12 MR. BARR: I'll object. The question is unclear
13 and a lack of foundation.
14 THE WITNESS: I don't recall the dates relative to
15 this date.
16 BY MR. JACOBSON:
17 Q Now this problem that's addressed in the Riverside
18 Highland Water Company tank, is this -- was this a very
19 atypical situation in 1984 for you? Or was this a very
20 typical situation of dealing with the various different
21 purveyor's water tanks.
22 A This was very atypical, in respect to how this problem
23 occurred. The total lack of responsiveness of the water
24 utility. And as I recall, the contractor, either the
25 contractor or sub, was one whose reputation was a little

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1 tainted at that time.
2 So it was a combination of negative circumstances
3 surrounding this one, that were not present in most water
4 utilities. Public water utilities, whether they're
5 privately owned or mutually owned like this one, or a
6 municipality, their -- they have been and were responsive in
7 the public health arena. This company had a bit of a
8 problem.
9 Q Were you ever aware of any kind of a problem, such as
10 is outlined in this November 21, 1984 memo, affecting any of
11 the facilities of the San Bernardino Municipal Water
12 Department?
13 A Absolutely none.
14 Q Are you familiar with the concept of forced air
15 ventilation in tanks that have been coated?
16 A Yes, I am.
17 Q Okay. You may want to take a look at 707, which was
18 one that was shown to you previously.
19 A Okay.
20 Q In Exhibit 707 at the bottom of the first page, there's
21 a question there that says: Was continuous forced air
22 ventilation used after final coat in accordance with AWWA
23 D102-7B or manufacturer's specifications?
24 MR. BARR: I think that's 78.
25 THE WITNESS: Yes, it is.

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1 MR. JACOBSON: You're right.
2 BY MR. JACOBSON:
3 Q This particular one 707, is of a tank located in San
4 Bernardino. Is that correct?
5 A Yes.
6 Q Okay. And does this indicate to you that forced air
7 ventilation was used on this particular tank?
8 A Yes, it does.
9 Q Now you were also shown yesterday Exhibit No. 705.
10 A Okay.
11 Q Do you recall that particular one?
12 A Yes.
13 Q And in there they outline certain criteria that they
14 would like each purveyor to follow. Do you see that?
15 A In paragraph 2?
16 Q Yes.
17 A Yes and paragraph 3. Okay.
18 Q Yes. Did you ever have any problem with the City of
19 San Bernardino Municipal Water Department cooperating with
20 this?
21 A Well, the answer is no. But I need to clarify this.
22 That, as I think I commented on yesterday, that this was a
23 separate district. There were some, I can't even remember
24 how many now, 13, 14 districts. Each, although there was
25 under the supervision of a regional engineer, which there

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1 were at varying times three, four or five in the State, each
2 district is a little bit of its own fiefdom if you will.
3 And there were times and there always have been
4 and always probably will be that the district takes, the
5 district engineer, proceeds with, you know, shaping policy a
6 little bit differently.
7 This memorandum was a San Diego District
8 memorandum or document. It wasn't sent, to my recollection,
9 to any water supplier outside of those three counties.
10 It may have been seen by some. We had it. There,
11 this was a period of transition when the policy, there was
12 two different documents that seemed to be the same, with
13 slight changes we talked about yesterday, that where both
14 came out of the State. Which I don't recall why, but this
15 kind of thing occurred. So I just wanted to clarify that
16 this document probably wasn't one that was being used
17 universally in the State and probably not in the San
18 Bernardino District area, so.
19 Q In speaking of this leaching problem we've been talking
20 about, based on your interaction with your other district
21 engineers and the regional engineers, was this leaching
22 problem considered to be a statewide area of concern in the
23 early 1980s?
24 A Yes, it was.
25 Q Now before you came to this deposition yesterday, did

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1 you have any conversations either in person or by telephone,
2 with any representatives of the United States?
3 A Yes. I talked to Mr. Barr and I talked to a gentleman,
4 whose name I don't recall, from the Corps of Engineers, just
5 several days prior. He essentially contacted me to verify
6 that I was the one they were looking for. I was this
7 particular Chet Anderson.
8 And I think I just had maybe at that time only one
9 – well, I've had two conversations with you I think before,
10 with Mr. Barr.
11 Q And what were the nature of those conversations?
12 A With the Corps of Engineers very general. It indicated
13 that it was related to the Superfund site in the San
14 Bernardino area.
15 I don't recall, in one of the conversations
16 between either Mr. Barr or that other gentleman, tank
17 coatings was mentioned. I don't remember if it was, there
18 was anything much beyond that said.
19 Other than that, it was just details about the
20 setting up the time and place of deposition, and that kind
21 of thing.
22 Q Can you take a look at 702 please. Now 702 is a
23 memorandum from Mr. Bartson to you dated, it says "August-
24 December 1981." And "Typing date: January 26, 1982."
25 Do you know who took the samples which are set

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1 forth in Exhibit 702?
2 A I would have said in reading it, it confirms what I
3 would have said, that they were taken by Department
4 representatives. Probably one of the three people, Mark
5 Bartson, Bill Gedney, Jeff Stone, although there we had
6 student assistants, interns from Cal Poly Engineering
7 Program. But I don't know if they were on board.
8 And I would conclude that because most of the
9 analysis were done by our laboratory. And we almost always
10 did the sampling when we took the samples to our laboratory.
11 Q All right. So the samples would have been collected by
12 an employee of the State of California?
13 A Yes.
14 Q Now do you know if these results were transmitted to
15 the City of San Bernardino Municipal Water Department?
16 A Yes, I do know they were.
17 Q Do you know if these results were transmitted to the
18 Environmental Protection Agency?
19 A I don't know that. At least not at that time, they
20 probably were not by the Department. The US EPA was not
21 really involved in anything concerned with the groundwater
22 contaminant. I mean, in general, they just weren't in the
23 picture yet.
24 Q But if the City received it and they turned it over to
25 EPA, that would have been between the City and EPA. Right?

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1 A Sure.
2 Q Now after you obtained the results that are set forth
3 on 702, do you recall what action, if any, your office took
4 to deal with the levels of contaminants that were reported
5 by your laboratory?
6 A After we received the results in this kind of time
7 frame in 1982?
8 Q Yes, early 1982 it appears.
9 A Well, no. We, the results we had received, would have
10 – the sampling was done over a period of August – starting
11 in August and there was the earlier summary, September. And
12 then we did additional sampling. We updated the summary.
13 And so we would have gotten those samples, you
14 know, within a week or so of the sampling time that – and
15 we probably had, you know, some of these summaries around.
16 But the memorandum, it just kind of formalized,
17 and the typing date, why there's two different dates, we –
18 trying to keep things chronologically in files. And that we
19 wanted the date when the action occurred and then the typing
20 date was just when it got – what happened, we had a backlog
21 on typing always.
22 And so that sometimes if you just put the typing
23 date on, it would sound like something was happening in
24 1982. When, in fact, it happened in 1981. So that was –
25 and I'm sorry. You asked what action we took or did we take

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1 action?
2 Q Yes.
3 A Yes. We always took action, notifying the water
4 utility. As a general practice and I don't remember
5 specifics, it was to recommend they not use the wells if
6 their levels were above any action levels or guidance we
7 had, if possible, or to blend them, or take some action.
8 But if they couldn't do that and there were
9 circumstances where utilities didn't have any choice, there
10 wasn't any mandate for any, you know, particular corrective
11 action at that time.
12 Q Okay. On attachment 1, page 2 of the exhibit, which is
13 approximately five pages back. There's a listing for the
14 Muscoy Mutual Water Company, well number 4.
15 A Yes.
16 Q And this appears to be below the action levels. Is
17 that correct?
18 A Yes.
19 Q Do you know where well number 4 of the Muscoy Mutual
20 Water Company is located?
21 A Generally I do.
22 Q And where is that located?
23 A Well, it's – see if I can, it would be north of
24 Highland Avenue, west of what is now known I think as I-215
25 in the general area of a little community known as Muscoy,

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1 which was an unincorporated area at the time.
2 Q If, by way of reference, if we go to the map on 709,
3 the last page of the map on 709, looking at that map, are
4 you able to make a rough approximation as to the location of
5 the Muscoy Mutual Water Company well number 4?
6 A Actually, I can't differentiate any, you know, Muscoy
7 Mutual Water Company well number 1, 2, 3, 4, where they were
8 relative to each other. But they weren't that widely
9 separated. They were all over in that area.
10 MR. BARR: I'm going to object. Lack of
11 foundation.
12 THE WITNESS: My recollection, and I have to
13 separate out Muscoy in general, I remember now that the So.
14 Cal Water Company, Delman Heights area was further down
15 closer to Highland, and Muscoy was out further.
16 So, on this map the wells, any of the wells would
17 have been I think went of Cajon Boulevard and north of
18 Highland Avenue.
19 And there were some wells that were in the
20 proximity of what is identified as the Loma Linda Fault and
21 may have been on the west side. But they, I don't recall
22 specifically.
23 BY MR. JACOBSON:
24 Q Okay. There was some discussion during your
25 deposition, as well as some of these memos contain some

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1 information about the possible leaching of PCE into water
2 tanks. And then testing the water tanks for levels of
3 contaminants.
4 During the early 1980s, do you ever remember
5 requiring that when they did the testing of these tanks for
6 leaching, that they first test the incoming water to
7 ascertain what the quality of the incoming water was into
8 the tank?
9 MR. BARR: Does he remember that as a general
10 practice?
11 MR. JACOBSON: Yes.
12 THE WITNESS: I don't think that was the general
13 practice. I think it occurred on occasion.
14 I recall seeing, you know, something that Mr. Barr
15 asked me to comment on yesterday, where some samples of the
16 – I think it was the San Bernardino mountain tank and I
17 think the sample is reflected by Jeff Stone.
18 And while they weren't clearly identified, there
19 were two analyses. One from a private laboratory, probably
20 collected by the City, where it was that I think it
21 identified it as influent. I think that's the one.
22 And then there was a sample that was on State
23 laboratory report form that identified the sample point as
24 mountain tank. Which I presume, but it wasn't clearly
25 indicated, that it was taken from, you know, the contents of

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1 the tank.
2 And the results, they were for organic analyses
3 for both of them. And there were some low level positive
4 findings of, on both of those, that were similar. And they
5 were mostly what we call the triolomethanes, chloroform,
6 bromoform, and bromodalchloromethane, and diabromo-
7 chloromethane, which were required to be monitored by
8 utilities with greater than 10,000 people. You know, in
9 their distribution system.
10 And the water looked the same, I mean you know,
11 roughly the same. Although there was a couple of other
12 volatile organic contaminants in the state report on the
13 mountain tank that were at very low levels. And that's I'm
14 recalling from seeing those analyses yesterday.
15 But I, I'm sure it was done. We may have, but I
16 don't think it was a common practice.
17 MR. JACOBSON: Okay. I have no further questions.
18 MS. RUSHTON: I have no questions.
19 MR. BARR: Okay. Go off the record.
20 (Brief off the record.)
21 EXAMINATION
22 BY MR. BARR:
23 Q Mr. Anderson, just a couple of questions. Looking back
24 at Exhibit 707.
25 A Okay.

Page 1

1 Q You were asked a few questions by Mr. Jacobson on that
2 exhibit. Are you familiar enough with coating application
3 procedures to know whether the diagram of the ventilation
4 that was used is a proper procedure or not?
5 A Well my, to the extent that I had knowledge of the
6 procedures and the requirements, that this would appear to
7 be a relatively good procedure, in terms of locations.
8 Obviously, using two fans, that wasn't done as much. I mean
9 one fan would have been more common.
10 The relative locations to try and move the air in
11 a proper way, but I couldn't give you a wholly objective
12 numerical evaluation and say, yes, this was adequate or not.
13 Q Do you know if ventilation should have drawn air
14 through the bottom of the tank instead of the top? Do you
15 know whether that would have been a more effective
16 procedure?
17 A My interpretation of the diagram is that they are
18 drawing air through the bottom of the tank. The bottom,
19 being at the sides near the bottom, there would be no way to
20 draw air through the bottom itself. There are no openings.
21 Q Were you familiar with the practice of discharging air
22 through the bottom rather than through the top?
23 A No. Not that I would have judged it unacceptable. It
24 might have been effective.
25 Q Do you know which would have been more effective to

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1 vent, to discharge air through the bottom or through the
2 top?
3 A No, I don't.
4 Q So it would be outside your area of knowledge?
5 A Yes.
6 MR. BARR: All right. Mr. Anderson, unless
7 someone else has some questions for you, I think we're done.
8 MR. JACOBSON: I have no further questions.
9 MR. RUSHTON: No further questions.
10 MR. JACOBSON: Okay.
11 MR. BARR: Thank you, Mr. Anderson.
12 MR. JACOBSON: What are you going to do for the
13 signing of his deposition? Have it sent to him and then
14 have him return to you the original?
15 MR. BARR: Yes.
16 MR. JACOBSON: Okay. Do you understand how that
17 works? This is the time to ask.
18 THE WITNESS: Just what you said, it sounded
19 pretty straightforward, but --
20 MR. BARR: Yes. Just so you know, the court
21 reporter will send you the transcript with the exhibits.
22 You'll have an opportunity to make any corrections that are
23 necessary.
24 Once you've done that, if you could send them back
25 to the court reporter, they'll distribute it to me.

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1 THE WITNESS: Okay. I would assume that when you
2 talk about corrections, that I stick within the confines of
3 the questions asked and answered. And, you know, what my
4 answer was and if I realized that I hadn't -- or wasn't --
5 that I hadn't said something correctly, but that --
6 MR. BARR: I can't give you any advice.
7 We can go off the record at this point.
8 (Off the record from 11:17 a.m. to 11:20 a.m.)
9 MR. BARR: We're back on the record. While we
10 were off the record, we discussed generally the witness'
11 right to make any corrections or changes to his testimony as
12 he reviews the transcript. And that any changes that he
13 makes, may be the subject of additional questions at a later
14 date.
15 I believe the witness understands that and with
16 that understanding, I think we're concluded. Thank you.
17 (Thereupon the Deposition of Chester E. Anderson
18 was concluded at 11:20 a.m.)
19
20
21 Chester E. Anderson
22 DATED:_____
23
24
25

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1 CERTIFICATE OF REPORTER
2
3 I, NANCY J. PALMER, an Electronic Court Reporter
4 and Notary Public for the State of California, duly ap-
5 pointed and commissioned to administer oaths, do hereby
6 certify:
7 That I am a disinterested person herein; that the
8 witness, Chester E. Anderson, named in the foregoing
9 deposition, was by me duly sworn to testify to tell the
10 truth, the whole truth, and nothing but the truth; that the
11 deposition was reported electronically by me, Nancy J.
12 Palmer, an Electronic Court Reporter of the State of Cali-
13 fornia, and was therefore transcribed into typewriting.
14 IN WITNESS WHEREOF, I have hereunto set my hand as
15 Electronic Court Reporter and Notary Public on this 18th day
16 of June, 1999.
17
18
19 Nancy J. Palmer
20 Notary Public 1194623
21 Expires 9/5/2002
22
23
24
25

Exhibit 100

DEPOSITION OF PETER BRIERTY, TAKEN ON BEHALF OF THE UNITED STATES OF AMERICA, AT 222 WEST HOSPITALITY LANE, SECOND FLOOR, SAN BERNARDINO, CALIFORNIA, COMMENCING AT 9:23 A.M. ON TUESDAY, JUNE 22, 1999, BEFORE KRISTI M. VITALE, CSR NO. 10554, PURSUANT TO SUBPOENA.

A P P E A R A N C E S:

FOR THE PLAINTIFF CITY OF SAN BERNARDINO:

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FOR THE PLAINTIFF STATE OF CALIFORNIA:

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- AND -
UNITED STATES DEPARTMENT OF JUSTICE
ENVIRONMENTAL AND NATURAL RESOURCES DIVISION
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(CONTINUED)

ALSO PRESENT:

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I N D E X

W I T N E S S:	PAGE
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E X H I B I T S:

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711 - NOTICE OF RULE 30(B)(6) (6 PAGES)	7
712 - SUBPOENA (4 PAGES)	7
713 - SMALL QUANTITY GENERATORS OF TCE AND PCE IN THE CITY OF SAN BERNARDINO (7 PAGES)	7

INFORMATION REQUESTED:
(NONE)

PETER BRIERTY,
HAVING BEEN FIRST DULY SWORN, WAS EXAMINED AND TESTIFIED AS FOLLOWS:

EXAMINATION

BY MR. CARSON:
Q FOR THE RECORD, WOULD YOU PLEASE STATE YOUR NAME, HOME ADDRESS, AND PHONE NUMBER.
A SURE. MY NAME IS PETER SKYE BRIERTY, AND I LIVE AT 28675 HILLTOP DRIVE IN THE CITY OF HIGHLAND; ZIP CODE, 92346.
Q AND THE PHONE NUMBER?
A (909) 863-9750.
Q HAVE YOU EVER GIVEN TESTIMONY IN COURT OR IN DEPOSITION BEFORE?
A YES, I HAVE.
Q HOW MANY TIMES?
A OH, SOMEWHERE BETWEEN FIVE AND TEN.
Q HAVE THEY PRIMARILY BEEN IN CONNECTION WITH YOUR OFFICIAL DUTIES?
A YES. EVERY TIME THEY HAVE BEEN IN ASSOCIATION WITH MY PROFESSIONAL DUTIES.
Q THEN YOU'RE FAMILIAR THAT A TRANSCRIPT IS GOING TO BE PREPARED TODAY BASED UPON EVERYTHING

THAT IS SAID IN THE DEPOSITION?
A YES.
Q YOU MAY HEAR ATTORNEYS OBJECT TO QUESTIONS. UNLESS YOUR ATTORNEY INSTRUCTS YOU NOT TO ANSWER A PARTICULAR QUESTION, THEN YOU SHOULD NOT REALLY PAY ANY ATTENTION TO THE OBJECTIONS. THEY'RE JUST FOR THE RECORD. THE COURT WILL DEAL WITH THEM LATER. AND GO AHEAD AND ANSWER THE QUESTION.
EVEN THOUGH THIS IS SORT OF AN INFORMAL SETTING, YOU UNDERSTAND THAT YOU ARE UNDER OATH JUST AS IF YOU WERE TESTIFYING IN A COURT OF LAW?
A THAT'S CORRECT.
Q AND AS WE GO ALONG, IF YOU DON'T UNDERSTAND A QUESTION, I WILL BE HAPPY TO REPHRASE IT. JUST LET ME KNOW.
PLEASE WAIT UNTIL I HAVE FINISHED MY QUESTION BEFORE YOU GIVE ME AN ANSWER; AND IT'S IMPORTANT, AS YOU KNOW FROM YOUR PREVIOUS EXPERIENCE, THAT YOU HAVE TO ANSWER VERBALLY. THE COURT REPORTER CAN'T -- IT'S HARD FOR HER TO PUT DOWN A NOD OF THE HEAD --
A I UNDERSTAND.
Q -- OR SOMETHING LIKE THAT.
A I UNDERSTAND.
Q COUNSEL FOR THE COUNTY HAS REPRESENTED

1 TO US THAT YOU HAVE AGREED TO TESTIFY ON ITS BEHALF ON
2 A CERTAIN SUBJECT.
3 IS THAT YOUR UNDERSTANDING AS WELL?
4 A YES.
5 Q AND IS IT YOUR UNDERSTANDING THAT YOU
6 ARE AUTHORIZED TO SPEAK ON BEHALF OF THE COUNTY --
7 A YES.
8 Q -- WITH RESPECT TO THAT SUBJECT?
9 (EXHIBITS 711 AND 712 WERE MARKED FOR
10 IDENTIFICATION BY THE COURT REPORTER
11 AND ARE ATTACHED HERETO.)
12 BY MR. CARSON:
13 Q LET ME SHOW YOU WHAT'S BEEN MARKED AS
14 EXHIBIT 711. WOULD YOU PLEASE JUST TAKE A QUICK LOOK
15 AT THAT. GO AHEAD AND TAKE A LOOK AT THAT AND 712.
16 (MR. MEYER ENTERS THE DEPOSITION PROCEEDINGS.)
17 MR. CARSON: FOR THE RECORD, EXHIBIT 711 IS A
18 COPY OF THE RULE 30(B)(6) NOTICE OF DEPOSITION THAT
19 THE UNITED STATES SERVED UPON THE COUNTY OF SAN
20 BERNARDINO. AND FOR THE RECORD, EXHIBIT 712 IS A COPY
21 OF THE CORRESPONDING SUBPOENA THAT WAS SERVED UPON THE
22 COUNTY.
23 Q HAVE YOU SEEN THESE DOCUMENTS BEFORE?
24 A NO, I HAVE NOT.
25 (EXHIBIT 713 WAS MARKED FOR

1 IDENTIFICATION BY THE COURT
2 REPORTER AND IS ATTACHED HERETO.)
3 BY MR. CARSON:
4 Q LET ME NOW SHOW YOU EXHIBIT 713.
5 EXHIBIT 713 IS THE SMALL QUANTITY GENERATORS OF TCE
6 AND PCE IN THE CITY OF SAN BERNARDINO. AND IF I COULD
7 SEE 711 BACK, PLEASE. CATEGORY NO. 12 IN THE UNITED
8 STATES NOTICE OF DEPOSITION AND CORRESPONDING SUBPOENA
9 IS THE INVESTIGATION AND RESULTS OF THE INVESTIGATION
10 CONDUCTED BY THE SAN BERNARDINO COUNTY DEPARTMENT OF
11 ENVIRONMENTAL HEALTH SERVICES, HAZARDOUS WASTE
12 GENERATOR SECTION, WHICH PRECEDED OR LED TO THE
13 DOCUMENT ENTITLED "SMALL QUANTITY GENERATORS OF TCE
14 AND PCE IN THE CITY OF SAN BERNARDINO."
15 IS IT YOUR UNDERSTANDING THAT YOU WILL
16 BE TESTIFYING REGARDING THIS SUBJECT CATEGORY TODAY?
17 A YES, IT IS.
18 Q DO YOU KNOW OF ANYONE OTHER THAN YOU
19 WHO WOULD BE MORE KNOWLEDGEABLE ABOUT THAT SUBJECT
20 CATEGORY?
21 A WITH REGARD TO THE STUDY, POSSIBLY
22 STEPHEN VAN STOCKUM.
23 Q AND WHO IS HE?
24 A HE WAS THE SUPERVISOR OF THE PROGRAM
25 THAT CONDUCTED THE ACTIVITIES, AND HE'S CURRENTLY THE

1 DIVISION CHIEF FOR ENVIRONMENTAL HEALTH SERVICES IN
2 RIVERSIDE COUNTY.
3 Q SO HE IS NO LONGER THEN WITH THE COUNTY
4 OF SAN BERNARDINO?
5 A NO, HE IS NOT.
6 Q WHAT HAVE YOU DONE TO PREPARE FOR
7 TODAY'S DEPOSITION?
8 A I WAS INTRODUCED TO THE IDEA THAT I
9 WOULD BE DEPOSED FRIDAY AFTERNOON, AND I SEARCHED -- I
10 WAS TOLD THAT I WAS TO TESTIFY IN REGARD TO THIS
11 DOCUMENT, AND I SEARCHED MY FILES FOR IT. I ALSO
12 CALLED THE REGIONAL WATER QUALITY CONTROL BOARD AND
13 ASKED THEM IF THEY HAD A COPY OF IT. AND UNTIL THIS
14 MORNING WAS THE FIRST TIME I HAD SEEN THE REPORT SINCE
15 I HAD -- SINCE SHORTLY AFTER WE HAD FINISHED IT AND
16 PROVIDED IT TO THE REGIONAL BOARD.
17 Q AND I TAKE IT THEN YOU DID NOT FIND A
18 COPY OF IT IN YOUR FILES WHEN YOU SEARCHED FOR IT?
19 A NO, I DID NOT.
20 Q DID THE REGIONAL BOARD HAVE A COPY WHEN
21 YOU ASKED THEM?
22 A THE REGIONAL BOARD, WHEN I SPOKE TO
23 MR. KAMRON SAREMI THIS MORNING OF THE REGIONAL BOARD,
24 HE STATED THAT HE RECALLED THE REPORT, WENT TO THE
25 FILE THAT HE THOUGHT IT WOULD BE IN, AND HE COULD NOT

1 FIND A COPY OF IT EITHER.
2 Q AS YOU WERE REVIEWING YOUR FILES, DID
3 YOU FIND ANY OTHER DOCUMENTS THAT WOULD BE RELEVANT TO --
4 A NO.
5 Q -- THIS REPORT?
6 HAVE YOU -- OTHER THAN MR. SAREMI OF
7 THE REGIONAL BOARD, HAVE YOU SPOKEN TO ANYONE --
8 A MR. JOCKS.
9 Q -- TO PREPARE FOR THIS?
10 OTHER THAN MR. JOCKS.
11 A NO. MY SECRETARY, TELLING HER THAT I'M
12 LOOKING FOR THE FILE.
13 Q HAVE YOU EVER LOOKED AT OR READ ANY
14 DOCUMENTS, LOOKED AT ANY PHOTOGRAPHS OR DIAGRAMS
15 RELATING IN ANY WAY TO THE CAJON LANDFILL?
16 A YES. INCIDENTALLY, YES.
17 Q AND WHAT WERE THOSE?
18 A THOSE WOULD BE AN INTEREST IN THE SOLID
19 WASTE ASSESSMENT TEST, OR SWATS.
20 Q AND WHAT WAS YOUR INTEREST IN LOOKING
21 AT THE SWAT TEST?
22 A JUST IN GENERAL, AN ENVIRONMENTAL
23 HEALTH PROFESSIONAL LOOKING AT THE CONCEPT OF WHAT WAS
24 IN IT AND WHAT THEY FOUND. IT WAS UNRELATED TO THIS
25 ACTIVITY.

1 Q UNRELATED TO THE ACTIVITY --
2 A TO THIS.
3 Q -- DESCRIBED IN EXHIBIT 13?
4 A YES.
5 Q HOW LONG AGO WAS IT THAT YOU LOOKED AT
6 THE SWAT?
7 A I WOULD IMAGINE MORE THAN FIVE YEARS.
8 Q AND WERE YOU DIRECTED TO DO THAT --
9 A NO.
10 Q -- BY ANYONE AS PART OF YOUR JOB?
11 A NO.
12 Q YOU JUST DID IT FROM YOUR --
13 A I WORK IN THE SAME DEPARTMENT -- AT THE
14 TIME, I WORKED IN ENVIRONMENTAL HEALTH SERVICES; AND
15 IN THAT DEPARTMENT, THE LOCAL ENFORCEMENT AGENCY IS
16 OBLIGATED UNDER THE LAW TO REVIEW THE SWATS AND DO THE
17 SWATS. AND AS A PROFESSIONAL INTEREST, I LOOKED
18 THROUGH THEM.
19 Q DID YOU GLEAN ANYTHING FROM THE SWATS
20 THAT WAS RELEVANT TO --
21 A NO.
22 Q -- YOUR JOB? NO?
23 A NO.
24 Q ANY OTHER DOCUMENTS RELATING TO CAJON
25 THAT YOU HAVE LOOKED AT THAT YOU CAN RECALL?

1 A NO.
2 Q ARE YOU AT ALL FAMILIAR WITH THE
3 LITIGATION INVOLVING THE CITY OF SAN BERNARDINO, THE
4 STATE OF CALIFORNIA, AND THE UNITED STATES REGARDING
5 GROUNDWATER CONTAMINATION IN THE SAN BERNARDINO AREA?
6 A OTHER THAN WHAT I WAS INTRODUCED BY
7 MR. JOCKS ON FRIDAY AFTERNOON, I DID NOT KNOW THAT THE
8 CITY WAS INVOLVED IN A LAWSUIT WITH THE FEDERAL
9 GOVERNMENT.
10 Q COULD YOU TELL ME THE APPROXIMATE
11 VOLUME OF YOUR FILES THAT YOU SEARCHED?
12 A ANY FILES ARE KEPT IN THREE FILE
13 CABINETS OF APPROXIMATELY EITHER FOUR OR FIVE FILE
14 DRAWERS.
15 Q TO EACH CABINET?
16 A IN EACH CABINET. AND IN YESTERDAY
17 AFTERNOON'S CONVERSATION WITH MY SECRETARY, SHE SAID
18 THAT IT MIGHT BE IN STORAGE AT A U-HAUL FACILITY.
19 Q AND WHERE WOULD THAT FACILITY BE?
20 A I BELIEVE IT'S ON SOUTH WATERMAN.
21 Q AND IS IT LIKELY THAT OTHER DOCUMENTS
22 THAT ARE RELATED TO THIS STUDY -- IS IT LIKELY THAT
23 THEY WOULD ALSO BE THERE?
24 A IF I REMEMBER AT MOST OF THE -- THERE
25 WOULD BE SOME REPORTS OF INSPECTIONS WHEN WE WENT INTO

1 EACH ONE OF THE BUSINESSES. THERE MIGHT BE SOME ONE-
2 TO TWO-PAGE REPORTS OF WHAT WE SAW WHEN WE WENT INTO
3 THESE BUSINESSES.
4 Q IS THERE ANYWHERE ELSE THAT THE FILES
5 WOULD LIKELY BE THAT HAVE BEEN SENT TO STORAGE?
6 A IF THESE BUSINESSES ARE STILL IN
7 BUSINESS, AND I CAN'T REMEMBER JUST FROM LOOKING AT
8 THE LIST. BUT IN MY COURSE OF MY RESPONSIBILITIES,
9 I'M REQUIRED TO KEEP HAZARDOUS MATERIALS, HAZARDOUS
10 WASTE INVENTORY DATA IN AN ACTUAL WORK FACILITY FILE
11 ON ANY BUSINESS IN THE COUNTY THAT STORES, HANDLES,
12 TRANSPORTS, DISPOSES OF HAZARDOUS MATERIALS OR
13 HAZARDOUS WASTE.
14 SO THERE MAY BE A PIECE OF PAPER OR ONE
15 OF THOSE REPORTS IN ONE OF THESE ACTIVE FILES, IF
16 THESE ARE ACTIVE FACILITY FILES.
17 Q AND SPECIFICALLY YOU ARE REFERRING TO
18 THE BUSINESSES WHICH ARE IDENTIFIED --
19 A RIGHT.
20 Q -- IN EXHIBIT 713?
21 A YES, I'M REFERRING TO PAGE 613. HAVING
22 NOT HAD THIS REPORT, I DIDN'T HAVE THE ABILITY TO GO
23 AND SEARCH FOR THESE FILES THAT ARE LISTED HERE AND
24 SEE IF THERE WERE ANY DOCUMENTS RELATED TO THE
25 SURVEY. WHAT WE WOULD HAVE DONE IS GONE IN, TALKED TO

1 THE OWNER, SEEN IF THEY HAD ANY EVIDENCE OR
2 RECOLLECTION OF STORAGE OF TCE OR PCE AT THE
3 BUSINESS. AND IF WE FOUND SOME, WE WOULD HAVE
4 RECORDED IT ON A PIECE OF PAPER OR A REPORT, CREATED A
5 SURVEY FORM JUST FOR THIS ACTIVITY, AND THE NOTES
6 WOULD HAVE BEEN MADE BY AN INSPECTOR.
7 Q I WILL RETURN TO THAT IN A LITTLE MORE
8 DETAIL IN A MINUTE.
9 A SURE.
10 Q IS IT LIKELY THAT OR DO YOU KNOW IF ANY
11 DOCUMENTS THAT MIGHT BE RELEVANT TO THIS WOULD HAVE
12 BEEN DESTROYED AS OPPOSED TO SENT TO STORAGE?
13 A I'M SURE THERE WERE A LOT OF NOTES THAT
14 WERE MADE TO CREATE THIS DOCUMENT BECAUSE IT WAS PUT
15 TOGETHER AS A COLLABORATION BETWEEN MYSELF, THE
16 SECTION SUPERVISOR, A COUPLE LEAD PEOPLE, AND THE
17 INSPECTORS. SO THE NOTES THAT WERE USED TO CREATE
18 THIS PROBABLY WERE THROWN AWAY AT THE TIME. BUT THE
19 FINISHED DOCUMENT WOULD PORTRAY THE SALIENT ISSUES OR
20 THE IMPORTANT ISSUES THAT WE DISCOVERED DURING THE
21 INVESTIGATION.
22 Q AND DOES THE -- DO YOU ALL HAVE KIND OF
23 AN OFFICIAL RECORD-RETENTION POLICY OF KEEPING
24 DOCUMENTS FOR "X" MANY YEARS OR ANYTHING LIKE THAT?
25 A WE KEEP FACILITY FILES AS -- IF WE GO

1 BACK TO PAGE 613.
2 Q FILES FOR BUSINESSES?
3 A WE WOULD HAVE FILES FOR BUSINESSES.
4 BUT SINCE THIS WAS A SPECIAL REPORT AND I HADN'T SEEN
5 ANY INTEREST IN IT IN THE LAST TEN YEARS -- THAT'S IF
6 IT DOES EXIST IN ARCHIVES, IF YOU WILL -- THAT'S WHERE
7 IT WENT, OVER THERE; AND WE WOULDN'T HAVE A SPECIFIC
8 RETENTION POLICY -- WE DO NOT HAVE A SPECIAL RETENTION
9 POLICY ON PROJECTS OF THIS NATURE.
10 Q OKAY.
11 A BUT WE DO HAVE -- WE KEEP FACILITY
12 FILES WHETHER THEY ARE ACTIVE, INACTIVE, OR CLOSED.
13 WE KEEP THOSE FILES FOR AS LONG AS THE PAPER HOLDS
14 TOGETHER. WE DO NOT GET RID OF ANY FACILITY FILE
15 INFORMATION THAT I'M AWARE OF.
16 Q LET ME JUST GO QUICKLY OVER YOUR
17 BACKGROUND FOR THE RECORD. WHERE WERE YOU BORN?
18 A I WAS BORN IN BEDFORD, VIRGINIA.
19 Q DID YOU SPEND ANY TIME, WHEN YOU GREW
20 UP, IN THE SOUTHERN CALIFORNIA AREA?
21 A I WAS A CHILD OF AN AIR FORCE FAMILY
22 UNTIL ABOUT THE TENTH GRADE, WHICH WOULD HAVE BEEN
23 1970 IS WHEN I CAME BACK TO SOUTHERN CALIFORNIA, AND
24 HAVE STAYED IN SOUTHERN CALIFORNIA IN THE SAN BERNARDINO
25 AREA SINCE 1970. WENT TO HIGH SCHOOL, COLLEGE, AND MY

1 ENTIRE CAREER HAS BEEN WITH THE COUNTY OF SAN
2 BERNARDINO.
3 Q YOU WENT TO HIGH SCHOOL IN SAN
4 BERNARDINO COUNTY THEN?
5 A YES, ACTUALLY WENT TO ELEMENTARY SCHOOL
6 IN SAN BERNARDINO CITY, AS WELL AS WAS HERE FOR A
7 SHORT PERIOD OF TIME. THEN THE MILITARY TOOK ME OTHER
8 PLACES. MY PARENTS' MILITARY TOOK ME OTHER PLACES AND
9 THEN CAME BACK TO DO HIGH SCHOOL AND COLLEGE IN THE
10 SAN BERNARDINO CITY.
11 Q WHAT WAS THE NAME OF THE COLLEGE YOU
12 ATTENDED?
13 A CAL STATE SAN BERNARDINO.
14 Q AND WHAT DEGREE DID YOU OBTAIN?
15 A BACHELOR OF SCIENCE IN HEALTH SCIENCE.
16 Q AND ROUGHLY WHAT DOES THE STUDY OF
17 HEALTH SCIENCE ENTAIL, JUST IN GENERAL?
18 A IT INVOLVES -- MY PARTICULAR EMPHASIS
19 WAS IN ENVIRONMENTAL STUDIES. IT INVOLVES A
20 BACKGROUND OF BASIC HEALTH CONCEPTS, DISEASE
21 TRANSMISSION, ENVIRONMENTAL HEALTH STUDIES, WATER
22 SANITATION, LAND USE, WASTE MANAGEMENT, SAFE DRINKING
23 WATER, HAZARDOUS WASTE MANAGEMENT, CLEAN AIR ISSUES.
24 Q IS THERE A FAIR AMOUNT OF CHEMISTRY IN
25 THAT COURSE OF STUDY?

1 A YES, THERE IS. THERE WAS REGULAR
2 CHEM. THERE WAS BIOCHEM. THERE'S P CHEM. THERE'S
3 INORGANIC/ORGANIC. OF COURSE, IT WAS QUITE A WHILE
4 AGO. BUT YES, THERE IS.
5 Q DID YOU DO ANY POST GRADUATE STUDY?
6 A AS IN OFFICIAL M.B.A. OR MASTER'S?
7 Q YES. DID YOU DO A MASTER'S PROGRAM?
8 A NO, NO MASTER'S. NO PH.D.
9 Q DID YOU GRADUATE WITH ANY HONORS OR
10 AWARDS?
11 A YES, I DID.
12 Q WHAT WERE THEY?
13 A HONORS IN THE SPECIALTY FIELD OF
14 ENVIRONMENTAL STUDIES.
15 Q DID YOU GET ANY SCHOLARSHIPS IN
16 CONNECTION WITH YOUR STUDY?
17 A NO.
18 Q HAVE YOU EVER RECEIVED ANY AWARDS OR
19 HONORS IN CONNECTION WITH YOUR WORK FOR THE COUNTY?
20 A YES.
21 Q WHAT HAVE THEY BEEN?
22 A OH, RECOGNITION FROM THE BOARD OF
23 SUPERVISORS FOR MY WORK IN THE LANDERS EARTHQUAKE,
24 VARIOUS TYPES OF RECOGNITION FROM THE BOARD IN THE
25 FIELD THAT I WORK, INSTRUCTOR OF THE YEAR FROM

1 UNIVERSITY OF RIVERSIDE, INSTRUCTOR OF THE YEAR FOR
2 THE NATIONAL -- CALIFORNIA ENVIRONMENTAL HEALTH
3 ASSOCIATION.
4 Q WOULD ANY OF THEM RELATE TO TOPICS
5 CONCERNING THE MANAGEMENT OR DISPOSAL OF HAZARDOUS
6 WASTE OR CHEMICALS?
7 A YES. THE CLASS THAT I TEACH AT U.C.R.
8 IS IN THE REGULATORY FRAMEWORK OF HAZARDOUS MATERIALS,
9 AND THAT'S THE ONE I RECEIVED THE INSTRUCTOR-OF-THE-
10 YEAR AWARD FOR.
11 Q HAVE YOU EVER PUBLISHED ANY ARTICLES,
12 ANYTHING LIKE THAT?
13 A NO.
14 Q AND WHAT IS YOUR OFFICIAL OCCUPATION
15 NOW?
16 A MY OFFICIAL TITLE IS FIRE MARSHAL FOR
17 THE COUNTY OF SAN BERNARDINO, AND THAT INCLUDES THE
18 COMMUNITY SAFETY DIVISION, WHICH DOES YOUR TRADITIONAL
19 FIRE PREVENTION WORK INCLUDING FIRE INSPECTIONS,
20 PRE-FIRE INSPECTIONS, ARSON INVESTIGATIONS, AND
21 FIRE-RELATED PUBLIC EDUCATION.
22 I'M ALSO THE DIVISION CHIEF OF THE
23 HAZARDOUS MATERIALS DIVISION, WHICH IS COMPRISED OF
24 FOUR PROGRAMS, ONE OF WHICH IS FIELD SERVICES
25 INSPECTIONS, WHICH INSPECTS ALL BUSINESSES IN THE

COUNTY THAT HANDLE, STORE, TRANSPORT, DISPOSE OF HAZARDOUS MATERIALS AND HAZARDOUS WASTE; THE LOCAL OVERSIGHT PROGRAM, WHICH IS RESPONSIBLE FOR CLEANUP OF UNDERGROUND STORAGE TANKS, WITH A CURRENT CASELOAD OF 200, 250, TO 300 UNDERGROUND STORAGE TANKS.

I'M ALSO RESPONSIBLE FOR THE HOUSEHOLD HAZARDOUS WASTE PROGRAM IN WHICH WE HAVE ABOUT 20 FIXED COLLECTION SITES FOR HOUSEHOLD HAZARDOUS WASTE AROUND THE COUNTY.

AND THEN THE FOURTH PROGRAM IS THE EMERGENCY RESPONSE AND ENFORCEMENT PROGRAM THAT RESPONDS TO CHEMICAL EMERGENCIES AND INVESTIGATIONS OF ILLEGAL HAZARDOUS WASTE DISPOSAL AROUND THE COUNTY.

Q AND HOW LONG HAVE YOU BEEN IN THIS POSITION?

A THE FIRE MARSHAL POSITION, I THINK IT'S BEEN ABOUT FOUR MONTHS. THE HAZARDOUS MATERIALS DIVISION CHIEF POSITION, NINE YEARS. AND THE FIELD OF ENVIRONMENTAL HEALTH FOR THE COUNTY SINCE 1978.

Q SO WHEN YOU TOOK ON THE FIRE MARSHAL JOB, THAT WAS IN ADDITION TO YOUR CURRENT DUTIES THAT YOU ALREADY HAD?

A AS A HAZARDOUS MATERIALS DIVISION CHIEF, THAT'S CORRECT.

Q AND BEFORE YOU WERE THE DIVISION CHIEF,

WHAT WERE YOUR RESPONSIBILITIES? WHAT WAS YOUR JOB TITLE BEFORE THAT?

A HAZARDOUS MATERIALS DIVISION CHIEF, AND THAT WAS THE FOUR HAZARDOUS PROGRAMS I MENTIONED.

Q AND --

A FIRE MARSHAL ADDS JUST A WHOLE NEW DIVISION TO MY ACTIVITIES.

Q WHEN YOU STARTED IN 1978, WHAT DID YOU DO?

A I WAS AN UNPAID INTERN, AND I DEVELOPED MANAGEMENT BY OBJECTIVES, MBO PLANS FOR THE DEPARTMENT OF ENVIRONMENTAL HEALTH AND THE PLANNING DEPARTMENT.

Q AND HOW LONG DID YOU HAVE THAT POSITION?

A THAT WAS NINE MONTHS TO A YEAR.

Q AND THEN WHAT?

A THEN I WAS HIRED BY THE DEPARTMENT AS A STUDENT AIDE TO USE ENVIRONMENTAL RECORDS TO REDUCE THE POPULATION OF THE COMMON ROOF RAT UNDER A FEDERAL GRANT IN THE CITY OF ONTARIO.

Q THAT WAS ROUGHLY 1979?

A THAT WOULD HAVE BEEN 1979.

Q WHAT CAME AFTER THAT?

A I BECAME AN INSPECTOR IN THE SAFE DRINKING WATER PROGRAM FOR ENVIRONMENTAL HEALTH

SERVICES AS A PAID PROFESSIONAL. I INSPECTED WATER WELLS AND WATER SYSTEMS AROUND THE COUNTY. AND THEN SHORTLY THEREAFTER THAT TURNED INTO THE BEGINNING OF THE HAZARDOUS MATERIALS PROGRAM FOR THE COUNTY OF SAN BERNARDINO.

Q AND WHEN DID THAT PROGRAM BEGIN?

A IT WAS KIND OF INTEGRATED INTO THE -- MY SUPERVISOR, WHO WAS IN CHARGE OF INSPECTING WATER WELLS AND WATER SYSTEMS AND TAKING SAMPLES OF DRINKING WATER, BECAME INTERESTED IN HAZARDOUS MATERIALS MANAGEMENT. SO WE KIND OF INTEGRATED THE CONCEPTS OF HAZARDOUS MATERIALS MANAGEMENT IN HIS PROGRAM, AND IT EVENTUALLY DEVELOPED INTO ITS OWN PROGRAM.

IT IS NOW SEPARATE FROM THE SAFE DRINKING WATER PROGRAM IN ENVIRONMENTAL HEALTH. AND IT JUST PROGRESSIVELY DEVELOPED FROM THE EMERGENCY RESPONSE AND CREATED AN INSPECTION PROGRAM WHERE WE BEGAN INSPECTING BUSINESSES IN 1983. THEN WE BEGAN INSPECTING UNDERGROUND STORAGE TANKS AS A RESULT OF THE SHARE BILL IN 1984. WE BEGAN INSPECTING MATERIALS FACILITY IN 1986 AS A RESULT OF EPCRTK LEGISLATION AND THE WATERS BILL IN CALIFORNIA AND WENT ON FROM THERE.

Q IN THE COURSE OF THAT PROGRAM, DOES THE COUNTY HAVE REGULATORY AUTHORITY OVER ACTIVITIES THAT ARE CONDUCTED BY THE CITY OF SAN BERNARDINO?

A YES.

Q HOW ABOUT ARE THERE ANY STATE OF CALIFORNIA FACILITIES WITHIN THE COUNTY OF SAN BERNARDINO THAT YOU HAVE REGULATORY AUTHORITY OVER?

A YES.

Q WHAT WOULD THE STATE FACILITIES BE?

A THE STATE HAS SEVERAL UNDERGROUND STORAGE TANK FACILITIES. THE STATE HAS PRISONS THAT PRODUCE HAZARDOUS WASTE, STORE HAZARDOUS MATERIALS, AND HAVE UNDERGROUND STORAGE TANKS. CALTRANS HAS FACILITIES THAT STORE MATERIALS.

Q CALTRANS IS THE CALIFORNIA DEPARTMENT OF TRANSPORTATION?

A CALIFORNIA DEPARTMENT OF TRANSPORTATION DEPARTMENT.

Q AND WHAT DOES CALTRANS HAVE? I'M SORRY.

A MOSTLY GASOLINE, BUT THEY ALSO SERVICE VEHICLES. THEY PRODUCE WASTE OIL SOLVENTS, VEHICLE OPERATING FLUIDS, IF YOU WILL. SO THE CALIFORNIA HEALTH AND SAFETY CODE PROVIDES THAT THE LOCAL AGENCY INSPECTS ALL GOVERNMENTAL FACILITIES INSIDE ITS BOUNDARIES, INCLUDING CITY, COUNTY, STATE, AND FEDERAL FACILITIES, WHICH WE DO INSPECT AND REGULATE AND ENFORCE THE RULES ON.

Q CONTINUING ON AFTER THE 1980 TO '83 TIME FRAME, WHAT WAS YOUR JOB AFTER THAT?

A JUST PARTICIPATING IN AND DEVELOPING PROGRAMS, LIKE I SAID, WHEN UNDERGROUND TANKS CAME ALONG IN '84, '86, EPCRTK IN '86 OR SO. WE ALSO HAD THE TANNER LEGISLATION THAT WE WERE DEALING WITH AND CITING AND DEVELOPMENT OF HAZARDOUS WASTE FACILITIES IN THE COUNTY.

I WAS ALSO RESPONSIBLE FOR CEQA ISSUES RELATED TO DEVELOPMENT INVOLVING HAZARDOUS MATERIALS AND PROGRESSIVELY DEVELOPING IT FROM PART-TIME POSITIONS IN 1982 WITH PRACTICALLY NO BUDGET, TO A FULLY SELF-FUNDED PROGRAM OF ABOUT -- RIGHT NOW IT HAS ABOUT 55 PEOPLE IN IT.

Q DOES THE COUNTY FIRE DEPARTMENT COME UNDER THE DEPARTMENT OF ENVIRONMENTAL HEALTH?

A NO, IT DOES NOT. ALMOST FOUR YEARS AGO, THE COUNTY ADMINISTRATIVE OFFICE DETERMINED THAT THE HAZARDOUS MATERIALS DIVISION, WHICH FORMERLY RESIDED IN THE ENVIRONMENTAL HEALTH SERVICES DEPARTMENT, SHOULD BE MOVED INTO THE SAN BERNARDINO COUNTY FIRE DEPARTMENT.

SO WE HAD BEEN A DIVISION OF ENVIRONMENTAL HEALTH ALMOST FOUR YEARS AGO, AND WE WERE ONE OF THREE DIVISIONS IN ENVIRONMENTAL HEALTH.

AND THEN THE ADMINISTRATIVE OFFICE, WITH THE APPROVAL OF THE BOARD OF SUPERVISORS, MOVED MY DIVISION FROM ENVIRONMENTAL HEALTH INTO THE FIRE DEPARTMENT. SO THE SAME PEOPLE, SAME JOBS, SAME PHONE NUMBER, SAME OFFICE WERE ADMINISTRATIVELY MOVED INTO THE FIRE DEPARTMENT WITH NO CHANGE IN DUTIES, RESPONSIBILITIES, JUST A NEW BOSS.

Q AND DOES YOUR DEPARTMENT HAVE ANYTHING TO DO WITH REGULATING LANDFILLS IN ANY WAY?

A THAT RESPONSIBILITY LIES WITH THE LOCAL ENFORCEMENT AGENCY THAT IS IN ENVIRONMENTAL HEALTH SERVICES, THE LEA. THE ONLY TIME THAT WE GET INVOLVED IN IT IS IF THERE IS SOME FORM OF ILLEGAL DUMPING, MIDNIGHT DUMPING OF PRESUMED HAZARDOUS WASTES. THEN THE LEA PEOPLE ARE NOT TRAINED NOR EQUIPPED AS REQUIRED BY THE STATE OF CALIFORNIA TO RESPOND TO ILLEGAL DUMPINGS OF UNKNOWN SUBSTANCES.

AND IF THAT WERE TO OCCUR, THEN THE INCIDENT COMMAND SYSTEM WOULD PREDICATE THAT. MY FOLKS FROM THE EMERGENCY RESPONSE PROGRAM WOULD BE CALLED OUT TO ASSESS THE TYPE, NATURE, EXTENT OF WHAT WAS DUMPED OUT THERE. SO IN THAT SENSE, WE WOULD RESPOND TO AN EMERGENCY IF THERE WAS ONE AT A LANDFILL AND THEN FOLLOW UP THROUGH THE DISTRICT ATTORNEY'S OFFICE ON PROSECUTION.

Q AND HAVE YOU EVER HAD AN OCCASION OR HAS YOUR DEPARTMENT EVER HAD OCCASION, TO YOUR KNOWLEDGE, TO RESPOND TO SUCH AN INCIDENT AT THE CAJON LANDFILL?

A THERE -- AT ANY LANDFILL THAT'S OPERATING THERE'S A CHANCE THAT MATERIALS -- CHEMICAL-TYPE MATERIALS WILL BE DISCOVERED WHEN THE TRUCK DUMPS ITS LOAD. AND AS THE GARBAGE SPILLS OUT, SOMEONE MIGHT SPOT A CAN OF CHEMICALS OR A SOLVENT THAT SOMEBODY MIGHT SMELL.

Q SPECIFICALLY RELATED TO CAJON?

A I DON'T RECOLLECT, SPECIFICALLY REMEMBER THAT. I DO SPECIFICALLY REMEMBER A CASE IN THE EARLY '80S THAT WE WERE CALLED OUT TO CAJON WHEREIN SOME 55-GALLON DRUMS WERE DUMPED OUTSIDE OF THE LANDFILL BECAUSE THE LANDFILL WAS CLOSED. THEY FILLED UP A PICKUP TRUCK WITH 55-GALLON DRUMS AND DUMPED THE DRUMS. THEY WERE SPOTTED. WE WERE CALLED. WE WENT UP AND HIRED A CLEANUP CONTRACTOR TO PICK UP THE DRUMS AND HAUL THE MATERIALS AWAY. THEY WERE MOSTLY RESINOUS-TYPE MATERIALS THAT WERE PRETTY MUCH CLEANED UP. THERE WASN'T MUCH OF ANY TYPE OF LEACHING.

SOMETIMES WHEN DRUMS ARE DUMPED, THERE'S LIQUIDS, VERY FREE-FLOWING LIQUIDS THAT

SPILL. IN THIS CASE, THEY WERE MOSTLY RESINOUS, THICK, THICKER-TYPE SUBSTANCES WITH VERY LITTLE MATERIALS THAT LEAKED OUT OF THEM.

Q DID YOU IDENTIFY THE CHEMICAL STRUCTURE OF THE SUBSTANCES?

A YES. WE ALSO IDENTIFIED THE PERPETRATOR THAT FAILED TO REMOVE THE PACKING SLIP FROM ONE OF THE DRUMS, WHICH LED US RIGHT BACK TO HIS FACILITY.

Q NOT VERY BRIGHT, WAS HE?

A NO.

Q WHAT WAS THE SUBSTANCE?

A IT WAS RESIN-TYPE MATERIALS.

Q I'M NOT SURE THAT -- BEING A LAYPERSON, I'M NOT SURE THAT RESIN -- IS THERE ANYTHING MORE THAT YOU CAN TELL ME ABOUT THE RESIN? DID IT HAVE ANY HAZARDOUS WASTE IN IT, TO YOUR KNOWLEDGE?

A FROM WHAT I WOULD CONSIDER IT AT THE TIME, I CONSIDERED IT HAZARDOUS WASTE. IT WAS LISTED UNDER RESINS LISTED UNDER TITLE 22 AT THE TIME.

Q TITLE 22?

A OF THE CALIFORNIA ADMINISTRATIVE CODE. AT THE TIME I BELIEVE IT WAS -- NO, IT'S CALIFORNIA CODE OF REGULATIONS, AND AT THE TIME IT WAS CALIFORNIA ADMINISTRATIVE CODE. BUT THERE IS A LIST OF

SUBSTANCES, AND I BELIEVE RESINS ARE IN THERE. SO WE JUST SAID YEAH, THEY'RE HAZARDOUS WASTE. THEY'RE IN DRUMS. THEY NEED TO BE REMOVED AND CONTACTED THE COMPANY. AND I DON'T RECALL HOW FAR PROSECUTION WENT, BUT THAT WAS PROBABLY 1982 OR '83, SOMETIME IN THERE.

THE IMPORTANT CONSIDERATION IN ANY TYPE OF SITUATION IS HOW MUCH OF THE MATERIAL WOULD HAVE LEAKED INTO THE ENVIRONMENT, HOW MUCH SOIL WE WOULD HAVE REMOVED WITH IT. AND IF I RECALL, IT WAS MOSTLY CONFINED TO THE ACTUAL LOCATION OF THE DRUMS WHERE THE DRUM HAD BEEN KICKED OFF THE BACK OF THE TRUCK.

Q AND WHEREABOUTS ON THE LANDFILL DID THAT HAPPEN?

A THEY NEVER MADE IT INTO THE LANDFILL. THE LANDFILL WAS CLOSED AND FENCED. AND SO THEY DROVE ALONGSIDE ON AN ACCESS ROAD AND GOT OFF OF CAJON BOULEVARD, WHATEVER THEY PERCEIVED TO BE A SAFE ENOUGH DISTANCE, AND DUMPED THEM. AND I DO HAVE PICTURES OF IT. I DON'T RECALL ANY -- I DON'T KNOW IF WE COULD FIND A REPORT OF IT OR NOT.

Q ACTUALLY, I MIGHT. LET ME SEE HERE. WHAT YEAR WAS THIS?

A I WOULD HAVE TO GUESSTIMATE THAT IT WAS '82, '83.

Q DID YOU EVER HAVE OCCASION TO BE CALLED

OUT IN 1997 FOR DISPOSAL OF DRUMS?

A I DON'T THINK I WAS CALLED OUT IN 1997. MAYBE ONE OF MY STAFF PEOPLE WAS. THE FOLKS -- I HAVE TEN PEOPLE WHO WORKED IN THE VARIOUS PROGRAMS, AND PRIMARILY IN THE EMERGENCY RESPONSE AND ENFORCEMENT SECTION THAT ARE ON CALL. TWO OF THEM ARE ON CALL 24 HOURS A DAY; AND THEY ACTUALLY ARE THE RESPONSES THAT RESPOND TO THE EMERGENCIES.

IN THE EARLY '80S, SINCE I WAS ONE OF TWO-AND-A-HALF STAFF PEOPLE THEN, I RESPONDED TO A LOT OF EMERGENCIES, AND THAT RESPONSIBILITY TO RESPOND TO EMERGENCIES HAS DECLINED AS I HAVE MOVED INTO MORE OF A MANAGEMENT POSITION AND BEEN ABLE TO HIRE PEOPLE TO PERFORM THOSE RESPONSES PHYSICALLY.

Q DO YOU HAVE ANY SPECIFIC RECOLLECTION OF ANY OF YOUR STAFF BEING CALLED OUT TO CAJON REGARDING DRUMS IN 1997?

A NO.

Q IS THAT THE ONLY TIME THAT YOU WERE EVER --

A IT'S THE ONLY TIME THAT I CAN RECALL.

Q -- CALLED TO CAJON?

HAVE YOU EVER HEARD OF ANY OTHER INCIDENTS OF ILLEGAL DUMPING AT CAJON?

A THE SWATS, WHEN THEY WERE BEING

PERFORMED WHEN THE WELLS WERE BEING DRILLED, AND THE ISSUE OF DRILLING LOTS OF GROUNDWATER WELLS AND TESTING THE WATER IN THE LATE '80S AND EARLY '90S RESULTED IN A LOT OF RESPONSES TO A LOT OF PLACES BECAUSE SOMEONE WOULD SEE BLACK DRUMS SITTING IN A FIELD. THEY WOULD CALL THE FIRE DEPARTMENT. LOOKS LIKE THERE'S NO LABELING. THERE'S NO MARKING ON THEM, SITTING IN A FIELD. THEY WOULD CALL THE POLICE DEPARTMENT. THE POLICE DEPARTMENT DOES NOT APPROACH HAZARDOUS MATERIALS. THEY ASK THE FIRE DEPARTMENT TO DO IT. THE FIRE DEPARTMENT WOULD SHOW UP. THE FIRE DEPARTMENT WOULD SEE THE DRUMS AND CALL ME OR MY STAFF AND WE WOULD RESPOND OUT THERE. AND IN A HOST OF CASES, THEY WERE THE DRUMS THAT HELD EITHER THE BALING WATER OR THE DRILL CUTTINGS.

Q NOW, BEFORE YOU GO ON, ARE YOU SPECIFICALLY TALKING ABOUT CAJON OR ABOUT --

A I REMEMBER A CASE WHERE THE STAFF WENT OUT TO -- I BELIEVE IT WAS NEAR THE CAJON SITE WHERE THESE DRUMS WERE FOUND, AND THEY WENT OUT AND LOOKED AT THEM.

AND YOU TYPICALLY -- WE LEARN AFTER A WHILE TO SAY "IS THERE A LITTLE COFFEE-CAN LOOKING PIECE OF STEEL THAT IS SITTING OUT OF THE GROUND SOMEWHERE ADJACENT TO IT? YES, THERE IS. DOES IT

LOOK LIKE A WELLHEAD? YES, IT DOES," KIND OF A THING.

SO ONCE WE GOT EVERYBODY IN TUNE TO LOOKING AROUND FOR THE WELLHEAD, THEN WE FINALLY GOT PEOPLE INTO THE IDEA OF MARKING THEM, THAT THE DRUMS WOULD EITHER SAY "BALING WATER" OR "DRILL CUTTINGS" OR "NON-HAZARDOUS UNTIL DETERMINED OTHERWISE."

BUT BECAUSE THE REGULATION PRESCRIBES EVERYTHING THAT IS HAZARDOUS TO BE MARKED AS SUCH, YOU GET INTO A SITUATION IN THE OBVERSE WHERE NON-HAZARDOUS THINGS ARE NOT MARKED. SO WE RESPOND ALL OVER THE COUNTY TO THESE BLACK DRUMS WITH WHITE LIDS THAT WOULD APPEAR TO THE LAYPERSON, THE PASSERBY, THE CITIZEN, THAT THEY HAVE BEEN ILLEGALLY DUMPED.

Q OTHER THAN THOSE DRUMS ASSOCIATED WITH THE DRILLING WATER, ANY OTHER INCIDENT THAT YOU CAN --

A I CAN'T RECALL ANY SPECIFICS. BUT WHEN I WAS DOING THE RESPONSES, I RESPONDED TO A LOT OF INCIDENTS COUNTY WIDE. I JUST DON'T RECALL ANY.

Q I PRESUME YOU MAKE A REPORT WITH RESPECT TO THOSE KINDS OF THINGS?

A YES.

Q AND DO YOU MAINTAIN THOSE REPORTS AS WELL?

A THOSE ARE MAINTAINED IN CHRONOLOGICAL

ORDER.
Q FOR?
A FOR EMERGENCY RESPONSES.
Q CHRON ORDER COUNTY WIDE?
A COUNTY WIDE.
Q ARE THEY ALSO ORGANIZED BY LOCATION AT ALL?
A NO, COUNTY WIDE.
Q WHAT IS THE APPROXIMATE VOLUME OF THOSE REPORTS?
A I THINK THAT'S PROBABLY FOUR OR FIVE FILE CABINETS' WORTH. AND AS WE GET -- YOU KNOW, OBVIOUSLY WE ARE BACK INTO THE EARLY '80S WHEN THERE WERE ONLY TWO-AND-A-HALF PEOPLE DOING THIS. THEY WERE A LOT MORE SKETCHY THAN THEY ARE NOW.
Q THE AUTHORITY OF YOUR DIVISION TO INVESTIGATE THOSE TYPES OF THINGS WOULD HAVE FIRST STARTED WHEN? THE EARLY '80S?
A APPROXIMATELY, YEAH. '81, 82, SOMEWHERE IN THERE.
Q LET'S TURN BACK TO EXHIBIT 713. AND COULD YOU -- THAT'S IT. THERE YOU GO. IF YOU COULD, JUST FOR THE RECORD SO IT'S CLEAR WHAT WE ARE TALKING ABOUT, COULD YOU JUST IDENTIFY WHAT THAT DOCUMENT IS.
A SURE. IT'S A DOCUMENT WITH THE TITLE

AT THE TOP CALLED "SMALL QUANTITY GENERATORS OF TCE AND PCE IN THE CITY OF SAN BERNARDINO."
Q AND YOU ARE FAMILIAR WITH THAT DOCUMENT; CORRECT?
A FAMILIAR AS I CAN BE IN THE FEW MINUTES THAT I HAVE BEEN LOOKING AT IT. THE LAST TIME I SAW IT WAS PROBABLY NINE OR TEN YEARS AGO. A LONG TIME AGO.
Q WHEN WAS IT PREPARED, TO YOUR KNOWLEDGE?
A I WOULD HAVE TO JUST GUESS AT NINE OR TEN YEARS AGO.
Q SO LATE '80S?
A LATE '80S. I'M LOOKING FOR A DATE ON HERE, AND I DON'T SEE A DATE.
Q OKAY. IF YOU TURN TO THE SECOND PAGE --
A THERE YOU GO.
Q DECEMBER '86 UNTIL MAY '87; IS THAT CORRECT?
A THAT WOULD BE CORRECT.
Q WERE YOU FAMILIAR WITH THE DOCUMENT AS IT WAS BEING DRAFTED?
A YES.
Q HOW WERE YOU FAMILIAR WITH IT THEN?
A I WAS THE PERSON THAT ACTUALLY PROPOSED

THAT WE GET INVOLVED IN THE STUDY. AND AT THE TIME WE HAD A SECTION OR PROGRAM OF INSPECTORS WHO INSPECTED FACILITIES, AND THE ISSUE OF TCE AND PCE IN THE WATER UNDERLYING THE CITY OF SAN BERNARDINO AT THE TIME WAS A VERY IMPORTANT ISSUE TO THE FOLKS WHO DRANK THE WATER HERE. THERE WAS CONCERN THAT IT MIGHT BE HISTORIC.
SO I JUST DECIDED TO INVESTIGATE THE POTENTIAL FOR HISTORIC DISPOSAL OF TCE AND PCE IN THE SOILS OVERLYING THE GROUNDWATER OF THE CITY OF SAN BERNARDINO. THERE HAD BEEN WORK DONE TO IDENTIFY SOME LOCATION AROUND THE CITY, AND THE CITY REALIZED AND THE ENVIRONMENTAL HEALTH DEPARTMENT OF GROUNDWATER REALIZED THE GROUNDWATER WAS CONTAMINATED, AND I CONSIDERED IT IMPORTANT TO SEE WHO WOULD HAVE CONTRIBUTED TO IT.
Q DID YOU ACTUALLY TAKE PART IN THE DRAFTING OF THIS REPORT?
A PORTIONS OF IT. AS THE INFORMATION CAME IN AND AS THE FINDINGS CAME IN, MR. VAN STOCKUM, WHO I PREVIOUSLY MENTIONED, AND I WORKED TOGETHER ON IT. I WOULD IMAGINE THAT STEVE IS QUITE THE WRITER, AND I'M SURE HE DID PROBABLY A LOT OF THE WRITING, AND I DID A LOT OF THE REVIEWING.
Q BUT YOU WERE INTIMATELY FAMILIAR WITH

IT AT THE TIME?
A YEAH.
Q DID THE CITY OF SAN BERNARDINO PLAY ANY ROLE IN THIS STUDY?
A YES. THE HISTORY OF THIS STARTED ACTUALLY IN REDLANDS, AND REDLANDS IS UNDERLAIN WITH A CONTAMINATED PLUME. AND ALL SOURCES OF INFORMATION POINTED TO A SPECIFIC COMPANY THAT STARTED THAT, AND THAT COMPANY SAID, "WE THINK THERE'S OTHER PEOPLE THAT PARTICIPATED IN DUMPING THESE CHEMICALS."
Q WHAT WAS THAT COMPANY?
A I DON'T WANT TO SAY THE WRONG NAME, BUT IT WAS -- AND I'M TRYING TO THINK OF THE NAME. I CAN'T THINK OF IT. IF I CAN THINK OF IT LATER, I WILL COME BACK TO IT.
BUT ANYWAY, THEY CLAIMED WE CALLED THEM THE RESPONSIBLE PARTY. THEY SAID, "NO, WE'RE A POTENTIALLY RESPONSIBLE PARTY. YOU HAVE TO GO FIND ALL THE OTHER SOURCES THAT COULD HAVE DUMPED BEFORE WE'LL CLAIM OWNERSHIP OF IT."
Q WHAT WAS THE SPECIFIC SUBSTANCE OF IT?
A TCE AND PCE. AND WITH THAT IN MIND, WE DID A SURVEY IN REDLANDS, AND THAT SET THE FRAMEWORK FOR DOING THE ONE IN SAN BERNARDINO. WHAT WE DID IS VERY SIMILAR IN SAN BERNARDINO --

Q CAN I JUST INTERRUPT. I'M NOT FAMILIAR WITH THE GEOGRAPHY OUT HERE. I HAVEN'T SPENT ANY TIME OUT HERE. HOW CLOSE IS REDLANDS TO --
A YOU'RE TECHNICALLY IN SAN BERNARDINO. SAN BERNARDINO IS SITTING RIGHT OVER HERE, AND REDLANDS SITS ABOUT THREE MILES RIGHT OVER HERE.
Q IS IT A POLITICAL SUBDIVISION OF THE COUNTY OF SAN BERNARDINO?
A YES, IT'S A CITY. IT'S AN INCORPORATED CITY. AND THE ROLE OF THE CITY OF SAN BERNARDINO WAS THAT THE IDEA HERE WAS TO HISTORICALLY RECREATE THE DEVELOPMENT OF THE SEWER LINES IN THE CITY OF SAN BERNARDINO.
SO WE WORKED WITH THE CITY SEWERING AGENCY TO LAY OUT THE HISTORIC DEVELOPMENT OF SEWER LINES. THE IDEA IS THAT THEN WE WOULD OVERLAY THAT WITH THE BUSINESSES THAT MAY HAVE OR COULD HAVE HAD TCE OR PCE. THE IDEA IS THAT, IF WE FOUND A BUSINESS THAT WAS IN USE OR BEING USED -- IN OPERATION, RATHER, IF A BUSINESS WAS IN OPERATION THAT WAS SITTING ON A SEWER LINE, THE LIKELIHOOD IS THAT THEY WOULD HAVE DUMPED THE STUFF INTO THE SEWER LINE AND IT WOULD HAVE TO HAVE GONE TO THE SEWER TREATMENT PLANT.
IF THEY WERE SITTING ON A LOCATION ON A SEPTIC TANK, NOT ON A SEWER LINE, THEN THERE IS A

STRONG LIKELIHOOD THAT THEY COULD HAVE DUMPED THE MATERIAL INTO THE SEPTIC TANK OR INTO THE BACKYARDS, WHICH THEN WOULD HAVE HAD A GREATER CHANCE OF IT GOING INTO THE GROUNDWATER DIRECTLY AS OPPOSED TO GOING TO THE TREATMENT PLANT.
SO THE CITY OF SAN BERNARDINO PROVIDED US MAPS OF SEWER LINES FROM THE 1800'S UP UNTIL THE TIME OF THE REPORT, AND THEN WE TOOK THIS BIG MAP, USED DIFFERENT COLORED TAPE TO OUTLINE THE YEARS THAT THEY KNEW WHERE THE SEWER LINES HAD BEEN INSTALLED, AND THEN OVERLAID THE BUSINESSES.
AND IN DOING THE BUSINESS SURVEY, WE WENT TO THE CITY LIBRARY AND WE LOOKED AT OLD PHONE BOOKS, AND WE LOOKED AT PHOTOGRAPHS, AND WE LOOKED AT CHAMBER OF COMMERCE INFORMATION AND STARTED TO CREATE A VERY PRE GIS, PAPER VERSION OF A GIS OVERLAY IN WHICH WE HAD THE SEWER LINES AND THEN BUSINESSES, AND ALL OF THOSE WERE PHASED IN BY DATE.
Q DO YOU STILL HAVE THOSE MAPS?
A I LOOKED FOR THOSE AS WELL. I COULDN'T FIND THEM.
Q DO YOU THINK IT LIKELY THAT THEY MIGHT BE IN STORAGE?
A POSSIBLY. THEY WERE RATHER LARGE. AND WITH THE LITTLE PLASTIC TAPE WE HAD ON THEM, THE

1 PLASTIC TAPE ADHESIVE DIDN'T LAST LONG. SO, YOU KNOW,
2 WITHIN A YEAR FOLLOWING IT, AS WE KEPT ROLLING AND
3 UNROLLING THIS THING, AND PEOPLE WANTED TO SEE IT. AND
4 THEY HAD NEVER SEEN IT BEFORE, AND IT WAS KIND OF A --
5 YOU KNOW, OF A FRED FLINSTONE GIS PROGRAM, THE TAPE
6 STARTED FALLING OFF, AND THEY DIDN'T LAST AS LONG AS
7 WE WOULD HAVE LIKED THEM TO LAST.
8 AGAIN, IN THE DAY AND A HALF I HAVE HAD
9 TO SEARCH FOR THEM, I WOULD CERTAINLY BE INTERESTED
10 FROM JUST A HISTORIC PERSPECTIVE SEEING THEM AGAIN.
11 Q AS WOULD WE. WAS THERE ONLY ONE SET OF
12 THE MAPS?
13 A YES. THE LABOR THAT GOES INTO PUTTING
14 THE LITTLE TAPE ON THE STREET SEWER LINES WAS ENOUGH
15 THAT WE ONLY CREATED ONE OF THEM. WE COULDN'T PUSH
16 THE PRINT SCREEN BUTTON AND HAVE A NICE LITTLE GIS MAP
17 POP OUT, WHICH WOULD HAVE BEEN GREAT.
18 AT THE TIME WE HAD THE LITTLE AVERY
19 STICKIES THAT WE WOULD STICK ON THERE FOR THE
20 BUSINESS, AND WE WOULD LOCATE THEM BASED UPON THESE
21 LISTS OF BUSINESSES AND FROM THAT THEN WHERE THE SEWER
22 LINES WERE, WHERE THE BUSINESSES WERE, TRIED TO THEN
23 ASSOCIATE THAT WITH THE LOCATION OF CONTAMINATED WELLS
24 BECAUSE WE HAD INFORMATION FROM THE CITY.
25 THROUGH THE STATE DEPARTMENT OF HEALTH,

1 THE CITY IS REQUIRED TO TAKE SAMPLES OF THE WATER IN
2 THE WELLS. THE STATE DEPARTMENT OF HEALTH, CALIFORNIA
3 STATE DEPARTMENT OF HEALTH SERVICES IS OBLIGATED TO
4 ENFORCE THE REPORTING REQUIREMENTS. SO WE WENT TO THE
5 STATE DEPARTMENT OF HEALTH TO FIND THE WELL LOCATIONS
6 AND THEN THE RANGE OF CONTAMINATION OF EACH CONSTITUENT
7 IN THE WELLS.
8 AND THEN ONCE WE LOCATED THOSE,
9 WHEREVER THEY WERE, WE TRIED TO DRAW RELATIONSHIPS
10 BETWEEN SITES THAT WE KNEW HAD PCE/TCE, SITES THAT WE
11 THOUGHT MIGHT HAVE HAD PCE/TCE, SITES THAT COULD HAVE
12 HISTORICALLY HAD IT AND THE CONCEPT OF WHETHER THEY
13 COULD HAVE DUMPED IT INTO THE SEWER LINE OR DUMPED IT
14 IN THE BACKYARD.
15 Q WERE YOU ABLE TO DRAW SUCH RELATIONSHIPS
16 OR CORRELATIONS?
17 A NOT ANYTHING THAT WAS SO SIGNIFICANT
18 THAT WE FOUND AN ANSWER. WE COULD NOT FIND A REAL
19 STRONG RELATIONSHIP BETWEEN ANY PARTICULAR SITE EXCEPT
20 FOR THE -- I THINK EVERYBODY WAS LOOKING AT WHAT WE
21 CALLED THE CAT PIT UP ON THE NORTH END OF THE NORTH
22 SIDE OF THE LITTLE MOUNTAIN.
23 Q I NOTICE YOU WERE REFERRING TO THE MAP
24 ON THE BACK OF THAT. COULD YOU PERHAPS TAKE THAT PEN
25 THERE, IF YOU HAVE A PEN, AND JUST MARK ON THAT. IT

1 IS THE LAST PAGE OF EXHIBIT 713. IF YOU COULD JUST
2 DRAW A CIRCLE WHERE THE CAT PIT WAS LOCATED AND JUST
3 WRITE "CAT PIT" ON IT.
4 A THIS IS PAGE 616, AND THE CAT PIT WOULD
5 BE LOCATED NORTH OF WHAT'S IDENTIFIED AS KENDALL
6 DRIVE, SOUTH OF WHAT'S IDENTIFIED AS NORTH PARK
7 BOULEVARD, AND IN THE ADJACENT AREA TO THE WELL FIELD
8 THAT'S HERE. THAT'S WHAT I ASSUME. IT IS IDENTIFIED
9 AS "NEWMARK 1, 2, 3, 4," AND IT WOULD BE IN THIS
10 AREA.
11 Q AND WHAT CAN YOU -- BY THE WAY, BEFORE
12 WE GO ON, I NOTICED YOU ARE LOOKING AT YOUR BEEPER.
13 IF YOU EVER NEED A BREAK --
14 A CAN I JUST MAKE A LITTLE PHONE CALL?
15 MR. CARSON: SURE.
16 (RECESS.)
17 BY MR. CARSON:
18 Q I WOULD LIKE TO GO BACK JUST FOR A
19 MINUTE TO THE REDLANDS STUDY, THE CITY OF REDLANDS
20 STUDY.
21 A RIGHT.
22 Q WHAT DID THAT STUDY SHOW?
23 A IT SHOWED A HOST OF SITES THAT THE EPA
24 AND THE POTENTIALLY RESPONSIBLE PARTY HAD THROWN OUT
25 AT OTHER POTENTIALLY RESPONSIBLE PARTIES. MOST OF

1 THOSE WERE -- DIDN'T APPEAR TO BE INVOLVED.
2 I REMEMBER ONE OF THEM WAS A PAROCHIAL
3 SCHOOL THAT DIDN'T EVEN OWN A SCHOOL BUS WAS LISTED AS
4 A POTENTIALLY RESPONSIBLE PARTY. IT ACTUALLY
5 EXONERATED MANY PEOPLE THAT WERE ON THE EPA LIST AND
6 PRP'S LIST THAT THEY GAVE US.
7 BUT IT DID POINT BACK TO THE
8 POTENTIALLY RESPONSIBLE PARTY THAT I CAN'T REMEMBER
9 THE NAME OF AT THIS POINT IN TIME. I THINK IT WAS THE
10 LOCKHEED FACILITY, BUT I DON'T WANT TO GET LOCKHEED IN
11 TROUBLE IF IT WASN'T THEM. BUT I THOUGHT IT WAS THE
12 LOCKHEED SITE UP IN MINTONE (PHONETIC).
13 Q IF YOU DON'T REMEMBER DURING THE COURSE
14 OF THE DEPOSITION TODAY AND YOU REMEMBER LATER, IF YOU
15 COULD JUST TELL MR. JOCKS, I'D APPRECIATE IT.
16 A SURE.
17 Q DID THE CONTAMINATION AT THIS REDLANDS
18 SITE CORRELATE OR RELATE IN ANY WAY TO THE CONTAMINATION
19 OF GROUNDWATER IN THE CITY OF SAN BERNARDINO?
20 A NO. THEY'RE SEPARATED INTO TWO --
21 THEY'RE SEPARATED BY THE SANTA ANA RIVER INTO TWO
22 SEPARATE HYDRAULIC AREAS, AND ALSO BY LACK OF DATA
23 POINTS, NO CONTAMINATED WELLS BETWEEN THE TWO.
24 Q NOW, YOU HAVE SAID THAT THE CITY
25 PROVIDED INFORMATION REGARDING THE SEWER SYSTEM.

1 A UH-HUH.
2 Q WHAT ELSE DID THE CITY DO WITH RESPECT
3 TO THE PREPARATION OF THE STUDY?
4 A FROM WHAT I CAN RECALL, THE SEWER LINE
5 AND INSTALLATION TIMES, LOCATIONS, AND YEARS THAT THEY
6 WERE INSTALLED. THEY HAD TO PROVIDE THE INFORMATION
7 TO THE STATE DEPARTMENT OF HEALTH SERVICES FOR
8 LOCATING THE CONTAMINATION IN THE WELLS. AND I WAS
9 GOING TO SAY THE CITY LIBRARY BECAUSE THE CITY LIBRARY
10 HAS A SECTION, A HISTORIC SECTION THAT THEY KEEP WELL
11 PRESERVED AND RESTRICT ACCESS TO, AND THEY ALLOWED US
12 ACCESS INTO THEIR AREA OF THE LIBRARY TO REVIEW
13 HISTORIC PHONE BOOKS AND NEWSPAPERS AND THINGS LIKE
14 THAT.
15 Q AND WHAT INFORMATION DID THE PHONE
16 BOOKS GATHER?
17 A WE WERE LOOKING FOR BUSINESS NAMES IN
18 OLD PHONE BOOKS, IN OLD NEWSPAPERS, IN ANYTHING WE
19 COULD FIND OF HISTORIC NATURE THAT WOULD SAY THAT A
20 DRY CLEANING PLANT OR A PRINTER OF SOME NATURE WOULD
21 HAVE BEEN IN THE SAN BERNARDINO AREA AND WHETHER, YOU
22 KNOW, WE COULD RELATE THEM THEN TO A SEWER LINE OR A
23 UNSEWERED AREA.
24 Q WERE YOU ABLE TO DO SO? DID YOU GET
25 ANY VALUABLE INFORMATION FROM THE CITY LIBRARY?

1 A WELL, I DON'T KNOW. I GUESS IT DEPENDS
2 WHAT YOU MEAN BY "VALUABLE." THE FACT THAT YOU FIND
3 SOMETHING AND IT LEADS YOU IN A DIRECTION, AND ONCE
4 YOU GET THERE, YOU DON'T FIND ANYTHING, TO ME, THAT'S
5 STILL VALUABLE.
6 SO I THINK WE FOUND RATHER VALUABLE
7 INFORMATION. WHETHER IT ALL ADDED UP TO A CONCLUSIVE
8 ANSWER, THAT'S A DIFFERENT STORY. BUT IN TERMS OF
9 DOING THIS STUDY, I THOUGHT IT WAS RATHER VALUABLE.
10 YES.
11 Q AND THE INFORMATION THAT YOU WOULD HAVE
12 TAKEN FROM THE CITY LIBRARY, BE IT COPIES OR NOTES YOU
13 WOULD HAVE TAKEN OR WHATNOT, DO YOU THINK THAT WOULD
14 LIKELY BE IN THE STORAGE WITH THE OTHER DOCUMENTS, OR
15 IS IT HARD TO SAY?
16 A I WOULD SAY THAT THAT'S PROBABLY LESS
17 LIKELY. IT MIGHT BE THERE, BUT IT'S LESS LIKELY.
18 Q IS THAT THE EXTENT OF THE CITY'S
19 INVOLVEMENT OR YOUR USE OF CITY FACILITIES IN THE
20 STUDY?
21 A FROM THE BEST I CAN RECOLLECT, THEY
22 WERE VERY COOPERATIVE IN GIVING US WHATEVER WE ASKED
23 FOR.
24 Q AND DO YOU RECALL WHO WITH THE CITY YOU
25 WOULD HAVE BEEN COORDINATING TO OBTAIN INFORMATION?

A NOT SPECIFICALLY. BUT IT COULD HAVE BEEN MR. JIM WATSON OR MR. JOE STEJSKAL.
Q AND WHO ARE THOSE FOLKS?
A JIM WATSON AT THE TIME WAS ASSOCIATED WITH THE WASTEWATER TREATMENT PLANT AND JOE STEJSKAL WAS ASSOCIATED WITH THE PRODUCTION OF SAFE DRINKING WATER.
Q AS YOU WERE UNDERTAKING THE STUDY, DID ANYONE REPORT THAT THEY ACTUALLY DID PLACE TCE OR PCE DOWN THE DRAIN WHERE IT WOULD HAVE GONE INTO THE SEWERS? CAN YOU RECALL?
A NO, I DON'T RECALL.
Q HOW ABOUT IN THE SEPTIC?
A I DON'T RECALL ANY SPECIFICS.
Q IF WE CAN GO BACK TO THE CAT PIT FOR A MINUTE, WHAT IS THE CAT PIT?
A THE CAT PIT IS AN AREA THAT WAS AT THE END OF AN OLD ARMY MILITARY LANDING STRIP THAT WAS TO HAVE HAD BULLDOZERS OR CATERPILLARS -- HENCE THE WORD "CAT" -- HEAVY EQUIPMENT THAT WAS CLEANED. AND IT WAS DEGREASED USING SOLVENTS, AND THE SOLVENTS WERE ALLEGEDLY DUMPED INTO A PIT AT THE END OF THE RUNWAY PRIOR TO -- THIS WOULD HAVE BEEN IN THE '40S, PRIOR TO A LOT OF DEVELOPMENT, HOUSING BEING DEVELOPED IN THE NORTH SAN BERNARDINO AREA.

Q WHERE DID YOU GATHER THAT INFORMATION, IF YOU RECALL?
A I DON'T. BUT IT WAS -- IT WAS PRETTY COMMONLY STATED. I DON'T RECALL SEEING ANY SPECIFIC WRITTEN INFORMATION ON IT.
Q IS THERE ANYTHING -- WHAT ELSE WAS THE SIGNIFICANCE OF THE CAT PIT, IF ANYTHING?
A JUST THAT IT WAS OUR -- OUR PRIMARY THOUGHT WAS THAT THAT'S WHERE IT ORIGINATED, THE PLUME HAD ORIGINATED. BECAUSE IN THE TIME IN THE '80S WHEN THE EPA WAS WORKING WITH THE CITY TO DEVELOP THE CHARCOAL ABSORPTION BEDS FOR CLEANING UP THE GROUNDWATER, YOU COULD KIND OF WATCH THE PLUME HEADING SOUTH, AND YOU COULD WATCH THE LEVELS RISE AS THE PLUME HEADED SOUTH.
AND THIS STUDY WAS TO TRY TO, YOU KNOW, EITHER INCLUDE OR EXCLUDE PEOPLE FROM BEING POTENTIALLY RESPONSIBLE PARTIES. AND THE MOST SIGNIFICANT PART OF THE CAT PIT IS THAT THAT'S WHERE MOST PEOPLE THOUGHT THIS STUFF ORIGINATED, THE TCE, SLASH, PCE ORIGINATED.
I MEAN THAT'S JUST WHAT EVERYBODY THOUGHT. AND THAT STUDY WAS TO HELP -- WAS INTENDED TO HELP EITHER, YOU KNOW, ISOLATE IT, IDENTIFY IT, OR EXCLUDE POTENTIALLY RESPONSIBLE PARTIES.

Q DID YOU ALL DO ---I GUESS WHAT KIND OF INVESTIGATION DID YOU DO SURROUNDING THE CAT PIT TO DETERMINE WHO PUT WASTE IN IT OR WHEN WASTE WAS PUT IN IT?
A I DON'T RECALL MUCH OF THAT WORK AT ALL. I BELIEVE THAT THAT MIGHT HAVE BEEN DONE BY THE REGIONAL WATER QUALITY CONTROL BOARD BECAUSE I DON'T RECALL DOING THAT MUCH WORK IN THAT THERE'S -- I MEAN THERE WASN'T A REAL FACILITY THERE AT THE TIME WE WERE THERE. THERE'S NOT A DOOR YOU COULD GO KNOCK ON. WE ARE FACILITY INSPECTORS, AND WE WEREN'T -- THIS WOULD HAVE TO BE RESEARCHED BY SOMEBODY LOOKING FOR FORMER EMPLOYEES AND THIS TYPE OF THING.
Q NO ONE WITHIN THE COUNTY UNDERTOOK THAT TYPE OF STUDY?
A NOT TO MY RECOLLECTION. I COULD BE WRONG, BUT I DON'T REALLY RECALL. I REMEMBER WE WENT OVER TO CAMP ONO, WHAT USED TO BE CAMP ONO -- IT'S O-N-O -- AS A POTENTIAL SUSPECT, AND WE LOOKED AT AERIAL PHOTOGRAPHS OF THE CAT PIT AND CAMP ONO AND TRYING TO IDENTIFY SUPERFICIAL ARTIFACTS LIKE SOILED DIRT, DIRTY DIRT.
Q STAINING?
A STAINING. THANK YOU. SOMETIMES FROM AERIAL PHOTOGRAPHS YOU CAN SEE A BUILDING, AND OUTSIDE

YOU CAN SEE THE EXTREME OF SOMETHING, SOME SORT OF STAINS OF SOMETHING. WE DID LOOK AT AERIAL PHOTOGRAPHS OF BOTH CAMP ONO AND OF THE CAT PIT.
Q DO YOU RECALL --
A BUT THERE WASN'T REALLY ANY -- WE DIDN'T HAVE ANYBODY TO INTERVIEW. AND I DON'T KNOW IF THE CITY UNDERTOOK THAT OR THE EPA UNDERTOOK THAT, BECAUSE THERE WERE OTHER AGENCIES INVOLVED IN THE INVESTIGATION. WE WERE JUST -- YOU KNOW, WE WERE IN THE BUSINESS OF LOOKING AT FACILITIES AND BUSINESSES AND FACILITY FILES, AND THAT'S THE PORTION OF IT THAT WE TOOK ON.
Q WHO WOULD HAVE DONE THE REVIEW OF THE AERIAL PHOTOGRAPHS?
A I THINK STEVE LOOKED AT SOME OF THEM AND SOME FOLKS THAT WORKED FOR STEVE VAN STOCKUM.
Q WOULD THEY, TO YOUR KNOWLEDGE, HAVE ANY TRAINING IN INTERPRETATION OF AERIAL PHOTOGRAPHS?
A TO THE EXTENT THAT I WAS CURIOUS THAT THE RAILS WERE PULLED OUT OF CAMP ONO WITHIN MONTHS OF THE END OF THE WAR, THIS WAS KIND OF CURIOUS.
Q I'M SORRY. THE RAIL?
A YOU COULD CLEARLY SEE WHERE RAILROAD TRACKS HAD BEEN, AND YOU COULD CLEARLY SEE THAT IN THE PICTURES DATED '45 AND '46, THAT THE RAILROAD TRACKS

WERE GONE. SO PEOPLE, JUST AS AN ANOMALY, SAID, LOOK, HEY, THE RAILROAD TRACKS ARE GONE. WHY DID THEY MAKE SUCH AN EFFORT TO REMOVE THE RAILROAD TRACKS FROM CAMP ONO SO SOON AFTER THE WAR?
BUT TRAINED IN AERIAL INTERPRETATION, NO, BUT TRAINED IN LOOKING AT STAINS. AIRLINE INTERPRETATION IS A PRETTY BROAD FIELD. BUT THEY WERE IN THE BUSINESS OF LOOKING FOR STAINS, STACKS OF DRUMS, TANKS. SOMETIMES TANKS, EITHER STATIONARY OR MOBILE, CAN BE IDENTIFIED FROM THE AIR. THE STACKS OF 55-GALLON DRUMS CAN BE IDENTIFIED, FIVE-GALLON PAILS IN STACKS, THOSE TYPES OF THINGS.
Q AS PART OF THIS SURVEY OR AS PART OF ANY OTHER STUDY, HAVE YOU LOOKED AT AERIAL PHOTOGRAPHS OF OTHER PARTS OF THE CITY OF SAN BERNARDINO WITH RESPECT TO BUSINESSES OR INDUSTRIES OR WITH ANYONE TO SEE IF YOU COULD SEE THOSE TYPES OF THINGS IN THE PHOTOGRAPHS?
A WE DIDN'T -- WE DIDN'T DO THAT IN THE SURVEY OF THIS CITY BECAUSE THE ACTUAL INSPECTORS WENT AND KNOCKED ON DOORS AND THEN WALKED AROUND THE BUSINESSES. I DON'T RECALL LOOKING AT PHOTOGRAPHS OF SAN BERNARDINO CITY, THE AREA ALONG E STREET, WATERMAN AND MOUNTAIN VIEW THAT WE SURVEYED. I DON'T RECALL LOOKING AT AERIAL PHOTOS THERE.

BUT THE COUNTY DOES HAVE A RATHER EXTENSIVE HISTORY OF AERIAL PHOTOGRAPHS GOING BACK TO THE '20S ACTUALLY. THAT'S WHERE WE RETRIEVED THE PHOTOS, AND COUNTY FLOOD CONTROL AND TRANSPORTATION FLOOD CONTROL HAS QUITE AN EXHAUSTIVE ARRAY OF AERIAL PHOTOS.
Q WHERE WOULD THEY BE LOCATED?
A WAS IT 853 THIRD STREET AT THE TRANSPORTATION/FLOOD CONTROL/PUBLIC WORKS BUILDING ON THIRD STREET, THIRD AND LENA.
Q DO YOU KNOW IF THE CITY OF SAN BERNARDINO EVER CONDUCTED ANY STUDIES OF ITS OWN WITH RESPECT TO SMALL QUANTITY GENERATORS OF PCE OR TCE?
A I'M NOT AWARE OF THEM, IF THEY DID.
Q AND THIS STUDY FOCUSED ON, AS IT STATES, SMALL QUANTITY GENERATORS OF TCE AND PCE.
A UH-HUH.
Q TO YOUR KNOWLEDGE, WERE THERE EVER ANY LARGE VOLUME GENERATORS OF TCE OR PCE IN SAN BERNARDINO COUNTY?
A THAT'S A GOOD QUESTION IN THAT I HADN'T THOUGHT OF IT THAT WAY, BUT YOU WOULD THINK THAT THIS WOULD THEN EXCLUDE LARGE QUANTITY GENERATORS. THAT'S A GOOD POINT. NEVER THOUGHT OF IT IN THOSE TERMS.
WE DIDN'T SUSPECT THAT THERE WERE ANY

AFTER LOOKING THROUGH THE RECORDS AND THAT TYPE OF A THING. WE DIDN'T SEE ANY LARGE QUANTITY PRODUCERS. OTHERWISE, I BELIEVE WE WOULD HAVE PROBABLY BEEN THE PEOPLE TO INSPECT THEM, BECAUSE WE WERE WORKING WITH THE REGIONAL BOARD. AND SINCE THE REGIONAL BOARD HAD SEEN WHAT WE HAD DONE IN REDLANDS, THEY SAID, "HEY, YOU WANT US TO DO THIS IN SAN BERNARDINO? SURE. YOU CAN TAKE CARE OF THIS PORTION OF IT, AND WE WILL TAKE CARE OF OTHER PORTIONS OF IT."

Q HOW EXHAUSTIVE DO YOU THINK THIS STUDY WAS IN TERMS OF -- THE QUESTION I'M LEADING TO IS DO YOU THINK IT LIKELY THAT ANY POTENTIAL GENERATORS OF TCE OR PCE WOULD HAVE BEEN LEFT OUT OR NOT MENTIONED ON --

A OH, YEAH.

Q -- THIS STUDY?

A WE ARE A FEE-SUPPORTED ORGANIZATION. AND A LOT OF THESE BUSINESSES THAT WE WERE DOING THE WORK IN ARE HISTORIC -- I.E., THEY DON'T PRODUCE ANY FEES. SO THIS WAS ALL DONE OUTSIDE OF HOW WE NORMALLY OBTAIN FEES FOR SERVICE AND WAS DONE IN THE SPIRIT OF DETERMINING INCLUSIVELY OR EXCLUSIVELY WHO WOULD HAVE CONTRIBUTED TO THE PLUME, IN COOPERATION WITH THE SANTA ANA REGIONAL WATER QUALITY CONTROL BOARD. SO I BELIEVE WE ACTUALLY HAVE A DISCLAIMER IN HERE.

ALTHOUGH THE ORIGINAL GOAL OF THIS PROJECT WAS TO IDENTIFY ALL PAST AND PRESENT USERS OF PCE AND TCE WITHIN THE CITY OF SAN BERNARDINO, DUE TO BOTH TIME RESTRICTIONS AND MANPOWER SHORTAGES, NOT ALL BILLS WERE SURVEYS. WE DID COMPLETE AREA NO. 5, WHICH WAS OUR GREATEST CONCERN. I BELIEVE THAT COMES FROM THE REGIONAL BOARD, WHOSE DUTY UNDER THE CALIFORNIA WATER CODE IS TO PROTECT THE BENEFICIAL USES OF THE WATERS OF THE STATE, AND WAS CERTAINLY INTERESTED IN A LABOR FORCE GOING OUT AND INSPECTING THOSE SORTS OF BUSINESSES.

Q LET ME TURN TO THE REGIONAL BOARD. IN THE BEGINNING OF THIS, IT STATES THAT THE REGIONAL BOARD WAS UNDERTAKING A LARGER INVESTIGATION TO IDENTIFY THE SOURCES OF TCE CONTAMINATION IN THE CITY'S GROUNDWATER.

DO YOU KNOW WHAT THAT INVESTIGATION CONSISTED OF OR ENTAILED?

A I DON'T THINK I COULD RECITE IT HERE TODAY. BUT THIS WAS A SUBSET OF -- THIS REPORT THAT I'M SPEAKING TO IS A SUBSET OF THAT. SO I KNOW THAT WE WERE A PART OF WHAT THEY WERE DOING, BECAUSE THEY HAVE THE GREATER LEGAL OBLIGATION. WE WERE JUST A WORKFORCE THAT ASSISTED THEM.

Q WHO IN THE STATE DO YOU THINK WOULD BE

MOST KNOWLEDGEABLE?

A AT THE TIME KAMRON SAREMI -- K-A-M-R-O-N, S-A-R-E-M-I -- WAS WORKING FOR -- I'M TRYING TO REMEMBER HIS NAME NOW. THE EXECUTIVE OFFICER OF THE REGIONAL BOARD IS JERRY THIBAULT, AND THERE WAS A PERSON IN BETWEEN KAMRON AND JERRY.

Q ARE YOU TALKING ABOUT AT THAT TIME?

A AT THAT TIME. I THINK IT'S PROBABLY STILL THE SAME WAY. KAMRON IS MORE OF A STAFF SENIOR PROFESSIONAL WHO REPORTED TO A SUPERVISOR THAT WAS IN BETWEEN HIMSELF AND JERRY THIBAULT.

Q HAVE YOU EVER SEEN ANY RESULTS OF THEIR LARGER INVESTIGATION, ANY REPORTS OR ANYTHING LIKE THAT?

A I PROBABLY HAVE, BUT I CAN'T RECALL WHAT THAT DETAILS ARE AT THIS TIME. I MEAN IF I COULD SEE THE REPORT, I COULD PROBABLY RECOLLECT IT.

Q DO YOU HAVE A SPECIFIC RECOLLECTION THAT SUCH A REPORT EXISTS?

A I WOULD THINK THAT THERE WOULD BE ONE. WHEN I CALLED OVER THERE, THEY REMEMBERED THIS REPORT. KAMRON SAID, "OH, YEAH. I REMEMBER THAT REPORT. I REMEMBER YOU GUYS WORKING."

I SAID, "CAN YOU GO FIND IT?"

HE SAID, "I HAVE ALREADY LOOKED FOR IT,

AND I CAN'T FIND IT."

Q THE STUDY FOCUSED ON, YOU SAID, THE SEWER LINES?

A YES.

Q CAN YOU TELL US AGAIN WHY YOU FOCUSED ON THE SEWER LINES?

A SURE. WE WERE KIND OF LOOKING FOR THE LOCATIONS WHERE THERE WEREN'T SEWERS. SO IF YOU DRIVE UP "E" STREET RIGHT NOW, "E" STREET IS SEWERED, AND ANYBODY THAT'S ON "E" STREET WOULD HAVE DUMPED INTO THAT SEWER. SO GOING BACK HISTORICALLY TO SHOW THAT THE SEWER DIDN'T GET UP TO THE TOP OF "E" STREET UNTIL, YOU KNOW, 1920 OR '30 OR SOMETHING WOULD INDICATE THAT THE FOLKS THAT WERE PRE-SEWERED WERE DUMPING ON THE GROUND.

Q DID YOU LOOK AT THOSE FOLKS ALSO WHO MAY HAVE BEEN DUMPING ON THE GROUND?

A OH, YEAH. EVERYBODY WHO IS LISTED IN HERE -- THAT'S WHY IT'S KIND OF INCOMPLETE WITHOUT THE MAP -- WAS LOOKED AT EITHER THROUGH PAPER OR KNOCKING ON THEIR DOOR, IF WE COULD FIND THEM, IN RELATION TO WHETHER THEY WERE ON A SEWER OR NOT. AND THAT DATA SHOULD HAVE BEEN RECORDED ON THE INSPECTION FORM.

WHEN WE WENT IN THE PLACE, WE SHOULD HAVE BEEN ABLE TO TRACE IT BACK TO THE PAPER MAP AND

SAID THIS DRY CLEANER WAS IN BUSINESS BEFORE THE SEWER GOT THERE OR WAS NOT IN BUSINESS BEFORE THE SEWER GOT THERE.

SO THE WHOLE IDEA WAS TO DEVELOP A TIME RELATIONSHIP THAT WAS HYPOTHESIZING THAT, IF THERE WAS NOT A SEWER THERE AT THE TIME, THEY WERE DUMPING IN THE BACKYARD OR THE FRONT YARD OR SOMEPLACE ELSE. IN MANY RESPECTS IN THE '40S AND '50S, DUMPING ON THE GROUND WAS NOT AN UNCOMMON PRACTICE.

Q HOW ABOUT IN THE '60S AND '70S?

A THAT'S HOW I MAKE MY LIVING. IT WAS PRETTY UNCOMMON PRACTICE TO MANAGE YOUR TRASH THE WAY IT'S EXPECTED TO BE HANDLED TODAY.

Q IN THE '60S AND '70S?

A OH, YEAH, DUMPING ON THE GROUND, PRETTY COMMON.

Q HOW ABOUT THROWING IT OUT, OUT WITH THE DUMPSTER IN THE TRASH?

A NOT UNCOMMON. JUST HUMAN NATURE. THE MORE OBNOXIOUS THE SUBSTANCE, THE FURTHER YOU WANT IT AWAY FROM YOUR HOUSE. SO YOU TYPICALLY FIND THAT MORE ODOROUS SOLVENTS END UP IN THE TRASH BECAUSE IT GETS HAULED AWAY; AND LESS ODOROUS, OBNOXIOUS THINGS GET DUMPED ON THE GROUND ADJACENT TO THEIR BUSINESS. IT'S JUST THE WAY IT WORKED.

Q AND THAT WOULD HAVE BEEN TRUE WITHIN THE CITY OF SAN BERNARDINO DURING THAT TIME PERIOD?

A I WOULD ASSUME SO, YEAH.

Q ON PAGE 2 OF THAT REPORT, IT STATES THAT THE INVESTIGATION, AS WE MENTIONED, WAS CONDUCTED IN DECEMBER OF '86 THROUGH MAY OF '87 AND IS ONGOING.

WHAT CAN YOU TELL ME ABOUT THE ONGOING ASPECTS OF IT?

A THE "ONGOING" REFERS TO THE FACT THAT THE INSPECTORS IN THEIR NORMAL ASSIGNED INSPECTIONS WOULD STILL BE INSPECTING BUSINESSES. AND IF WE RAN ACROSS ANY TYPE OF ACTIVITY, YOU KNOW, THAT TIED BACK TO THIS, IF SOMEBODY GOT A COMPLAINT CALL OR COMPLAINT INVESTIGATION, THAT IT WOULD BE BROUGHT TO THE SUPERVISOR'S ATTENTION OR MY ATTENTION OR THE REGIONAL BOARD'S ATTENTION.

Q SPECIFICALLY IN YOUR EFFORTS TO GO KNOCK ON DOORS TO DO THE SURVEY, WAS THAT CONTINUED AT ALL PAST MAY OF '87?

A NOT MUCH, THAT I CAN RECALL. WE KIND OF USED THIS DOCUMENT AS AN END POINT.

Q SO THERE WAS NO FOLLOW-UP REPORT?

A I CAN'T RECALL ANY FOLLOW-UP REPORT IF THERE WAS, I JUST DON'T REMEMBER IT TODAY.

Q WITH RESPECT TO WHAT THIS STUDY WAS

GETTING AT, DO YOU KNOW WHAT KIND OF RELEVANT INFORMATION YOU MIGHT HAVE GATHERED SINCE MAY OF 1987 THAT, IF YOU WERE GOING TO DO A FOLLOW-UP, WOULD BE INCLUDED?

A I CAN'T -- I CAN'T THINK OF ANYTHING THAT WE WOULD ADD IN TERMS OF WHAT WE HAD INTENDED TO SET OUT TO DO HERE. OBVIOUSLY METHODS OF TESTING ARE A LOT MORE SOPHISTICATED, AND A GIS SYSTEM WOULD MAKE IT A LOT SIMPLER.

FOR WHAT WE INTENDED TO DO AND WHAT WE ACCOMPLISHED, I THOUGHT IT WAS RELATIVELY COMPLETE. WE WOULD HAVE LOVED TO HAVE HAD MORE MANPOWER TO KNOCK ON MORE DOORS. I THINK THE DATA FROM THIS WELL TESTING POINTS BACK UP TO THE ORIGINAL PRESUMPTION.

Q IN THE COURSE OF YOUR WORK WITH THE COUNTY, SINCE THAT TIME, HAVE YOU EVER IDENTIFIED A POTENTIAL GENERATOR OF TCE OR PCE THAT YOU DON'T BELIEVE --

THE REPORTER: MAY I GET SOME WATER?

MR. CARSON: SURE.

(RECESS.)

BY MR. CARSON:

Q IN THE COURSE OF YOUR WORK WITH COUNTY SINCE THIS REPORT WAS GENERATED, HAVE YOU EVER IDENTIFIED A POTENTIAL OR KNOWN USER OF TCE OR PCE

EITHER HISTORICALLY OR AT THE PRESENT TIME THAT IS NOT INCLUDED WITHIN THE USERS LISTED IN THE STUDY?

A NOT THAT I CAN RECALL. IN THIS TARGET AREA, NOT THAT I CAN RECALL.

Q HOW ABOUT ELSEWHERE WITHIN THE COUNTY OR CITY OF SAN BERNARDINO?

A I'M SURE WE HAVE IDENTIFIED A LOT OF SOURCES OF TCE WITHIN THE COUNTY. AUTOMOTIVE FACILITIES USE IT. AND THE PCE FOR DRY CLEANERS. IT'S THE SOLVENT OF CHOICE OF ALL DRY CLEANERS. SO I WOULD IMAGINE THERE'S LOT OF PLACES AROUND THE COUNTY THAT USE TCE AND PCE.

Q HOW ABOUT WITHIN THE CITY OF SAN BERNARDINO?

A I CAN ONLY IMAGINE THAT YES. THERE ARE OTHER USERS OF TCE AND PCE IN THE CITY. BUT THE REPORT SPECIFICALLY ADDRESSES A SPECIFIC AREA.

Q THAT WAS AREA FIVE, I THINK IT WAS. WE'LL GET TO THAT IN A MINUTE.

THERE ARE TWO APPENDICES TO THIS STUDY, APPENDIX A AND APPENDIX B, THAT WE DON'T HAVE AND HAVE NOT BEEN PRODUCED TO US. YOU DIDN'T FIND THIS IN YOUR FILES. DO YOU THINK THE APPENDICES WOULD BE CONTAINED IN YOUR --

A NOW THAT YOU REMIND ME, THE APPENDICES

MIGHT ACTUALLY BE THE INSPECTION REPORT, ONE OF THE APPENDICES. I BELIEVE THOSE WERE APPENDICIZED SO THE OTHER AGENCIES INVOLVED COULD SEE WHICH PLACES WE WENT TO, WHAT WE SAID, WHO WE SAW, WHO WE TALKED TO. SO AS A REMINDER, I BELIEVE THAT'S WHAT THEY ARE.

Q AND DO YOU RECALL WHAT INFORMATION WAS ASKED ON THOSE SURVEY FORMS? WHAT WERE THE BLANKS TO BE FILLED IN?

A NOT SPECIFICALLY. BUT IN GENERAL IT WAS, YOU KNOW, HAVE YOU EVER USED IT? DO YOU KNOW OF ANYBODY WHO HAS USED IT? DID YOU USE IT HERE? IF YOU DIDN'T USE IT, DO YOU KNOW SOMEBODY WHO DID AND HOW DO WE GET AHOLD OF THEM AT ANOTHER LOCATION?

SO WE WENT FROM THAT POINT, FROM THAT DATE, THAT POINT, WE WENT GEOGRAPHICALLY OUT, MEANING, YOU KNOW, ANYBODY IN YOUR BUSINESS OR OPERATION OR ASSOCIATED WITH YOU THAT WOULD DO THIS? AND THEN WE WENT HISTORIC AT THAT SITE. DO YOU KNOW WHAT BUSINESS WAS HERE BEFORE YOU? HOW LONG HAS THIS BUSINESS BEEN HERE? IF YOU HAD THESE CHEMICALS, DID YOU DUMP THEM ON THE GROUND OR PUT THEM IN THE SEWER? THAT TYPE OF THING. SO A LATERAL AND A VERTICAL KIND OF HISTORICAL STUDY.

Q WITH RESPECT TO THE SEWERS, WAS YOUR CONCERN AT ALL THAT THE SEWER PIPES THEMSELVES MAY

HAVE LEAKED THIS SUBSTANCE TO THE GROUNDWATER?

A YEAH, ORIGINALLY WE THOUGHT THAT THAT WOULD BE A PRETTY DECENT AND DIRECT CONDUIT OF THE SOLVENT AWAY. BUT THEN AS WE WORKED WITH THE SEWERING PEOPLE, THEY SAID THAT SOME OF THE EARLIER PIPES WERE TERRA-COTTA TILE-TYPE PIPES THAT WERE SUBJECT TO CRACKING. AND SO IT WASN'T AS TIDY AS WE ORIGINALLY THOUGHT IT WOULD BE. BUT IN SEWER MAINTENANCE, SEWER LINES DO INDEED LEAK.

AS WE GOT OUT OF OUR AREA, IN THE SOUTHBOUND AREA, AS WE GET INTO SOUTHERN SAN BERNARDINO AREA, THE GROUNDWATER TENDS TO FLUCTUATE PRETTY DRAMATICALLY AND WHETHER OR NOT THOSE TERRA-COTTA PIPES WERE ACTUALLY HOLDING WATER IN OR LETTING WATER OUT OR CONVEYING WATER WAS QUESTIONABLE.

BY THE TIME WE HAD GOTTEN OUT OF OUR TARGET AREAS -- I'M SORRY. WHEN WE WERE IN OUR TARGET AREAS, WE WERE PRETTY MUCH IN DRY SOIL THAT WASN'T INTRUDED UPON BY GROUNDWATER. WE CERTAINLY, YOU KNOW, THOUGHT OF THE IDEA THAT THE PIPES COULD HAVE -- THE SEWER PIPES COULD HAVE LEAKED. BUT IT WOULD HAVE BEEN DRAMATICALLY DIFFERENT THAN IF SOMEBODY HAD POURED IT ON THE GROUND.

Q IN WHAT WAY?

A THAT IT WOULD -- THAT WHETHER THE PIPES

LEAKED OR NOT, IT'S STILL A MUCH MORE EFFECTIVE CONVEYANCE OF THE MATERIAL OUT OF THE AREA THAN POURING IT ON THE GROUND. POUR IT ON THE GROUND, IT STAYS THERE A LOT LONGER IN GREATER PERCENTAGES THAN IF YOU POURED IT INTO A SEWER LINE.

Q BECAUSE WITH THE SEWER LINE, IT WILL TRAVEL DOWN THE SEWER LINE?

A IT WILL TRAVEL AND IT WILL HAVE VOLUMES OF ADDITIONAL MAKEUP WATER WHICH WILL DILUTE IT AND EXPEDITE ITS REMOVAL FROM THE AREA.

Q DID YOU EVER CORRELATE ANY LOCATIONS WHERE CONTAMINATION WAS FOUND IN WELLS TO THE EXISTENCE OF THE SEWER PIPES?

A I THINK THAT'S PRETTY MUCH WHAT THE REPORT WASN'T ABLE TO DO, IS TO RELATE A SPECIFIC BUSINESS WITH A SPECIFIC SITE OF CONTAMINATION. THE GROUNDWATER WELLS, THE RESULTS FROM THE GROUNDWATER WELLS TO SOME PEOPLE PRETTY MUCH PREDICT THAT THE CONTAMINATION CAME FROM ONE AREA THAT WE COULD NOT FIND ANY OTHER BUSINESSES ASSOCIATED WITH.

Q YOU MENTIONED BEFORE THE BREAK SOMETHING ABOUT CONFIRMING THE ORIGINAL ASSUMPTION. DID YOU ALL BEGIN THIS STUDY WITH SOME ORIGINAL ASSUMPTION ABOUT WHAT YOU MIGHT FIND?

A OTHER THAN THE FACT THAT IT WAS PRETTY

COMMONLY STATED THAT IT WAS THE CAT PIT, WE SET OUT AND PUT A LOT OF EFFORT INTO TRYING TO FIND -- LOTS OF EFFORT INTO TRYING TO FIND OTHER POTENTIALLY RESPONSIBLE PARTIES. WE DID NOT WANT TO HAVE A POTENTIALLY RESPONSIBLE PARTY GO UNNOTICED, BECAUSE IT WAS COSTING THE CITY A GREAT DEAL OF MONEY, THE FEDERAL GOVERNMENT, THE TAXPAYERS A GREAT DEAL OF MONEY TO INSTALL THESE FILTRATION SYSTEMS, MILLIONS OF DOLLARS TO INSTALL THESE FILTRATION SYSTEMS, AND I FELT IT WAS IMPORTANT TO TRY TO FIND AS MANY POTENTIALLY RESPONSIBLE PARTIES AS WE POSSIBLY COULD TO PUT THAT COST BACK ON THE RESPONSIBLE PARTY.

AND THERE WERE SOME PEOPLE IN MY OFFICE THAT WERE CRITICAL OF THE FACT THAT WE WERE GOING OUT AND DOING THIS STUDY, THAT IT WAS AN UNFUNDED -- TECHNICALLY AN UNFUNDED STUDY, AND I JUST FELT THAT IT WAS IMPORTANT FOR US TO DO THIS.

Q IN TERMS OF THE -- I GUESS BEFORE YOU BEGAN THE STUDY, YOU HAD HEARD ABOUT THE CAT PIT.

A SURE.

Q DO YOU RECALL HOW YOU HEARD ABOUT IT?

A NO.

Q OR FROM WHOM?

A NO. NO SPECIFIC PERSON.

Q DO YOU RECALL IF ANYONE EVER TOLD YOU,

1 AS THE SURVEYS WERE BEING CONDUCTED, THAT THEY EITHER
2 POURED SOLVENTS OUT ON THE GROUND OR POURED THEM INTO
3 THE SEWERS?
4 A WHO POURED THEM OUT ON THE GROUND?
5 Q DO YOU RECALL ANY SPECIFIC INSTANCE
6 WHERE A PARTICIPANT IN THE SURVEY, ANY OF THE
7 BUSINESSES OR ENTITIES THAT WERE USING SOLVENTS TOLD
8 YOU OR TOLD YOUR INSPECTORS THAT THEY HAD POURED THEM
9 ON THE GROUND OR POURED THEM IN THE SEWERS?
10 A I DON'T RECALL. BUT THAT'S WHY WE HAD
11 THE INSPECTION REPORTS MADE UP. I DON'T RECALL ANY
12 SPECIFIC --
13 Q DO YOU THINK THOSE INSPECTION REPORTS
14 ARE STILL IN EXISTENCE THEMSELVES?
15 A I REALLY COULDN'T SAY. I WOULD
16 CERTAINLY BE INTERESTED IN FINDING THEM. AND IF I
17 COULD FIND THEM, I WOULD CERTAINLY WANT TO MAKE THEM
18 AVAILABLE TO WHOEVER WANTED TO SEE THEM.
19 IF I DO RUN ACROSS THEM, HOW SHOULD I --
20 SHOULD I GIVE THEM TO MY COUNSEL?
21 Q I WOULD TELL MR. JOCKS.
22 A OKAY. NOT A PROBLEM.
23 Q NOW, DID YOU -- WERE CITY OF SAN
24 BERNARDINO ENTITIES CONTACTED AS PART OF THIS, EVEN
25 THOUGH WE WOULD NORMALLY -- I WOULDN'T NORMALLY

1 CONSIDER A CITY TO BE LIKE A BUSINESS, BUT A CITY
2 OPERATION THAT MAY USE SOLVENTS, WERE THEY ALSO
3 CONTACTED?
4 A THEY WERE. AND I DON'T BELIEVE WE DID
5 THAT IN THIS STUDY BECAUSE OF THE GEOGRAPHIC LOCATION
6 OF WHERE WE WERE LOOKING. I CAN'T RECALL SPECIFICALLY
7 THAT WE DID. BUT THE CITY HAS INDEED BEEN INSPECTED
8 BY COUNTY INSPECTORS AND STATE INSPECTORS ON OTHER
9 EVENTS UNRELATED TO THIS.
10 Q AND WOULD THAT BE WITH RESPECT TO THE
11 HISTORICAL USE OF SOLVENTS OR JUST CURRENT USE OF
12 SOLVENTS?
13 A THE INCIDENTS IN WHICH WE WOULD HAVE
14 SPECIFIED WOULD HAVE JUST BEEN IN COMPLIANCE WITH THE
15 HEALTH AND SAFETY CODE, THE CALIFORNIA CODE OF
16 REGULATIONS FOR MANAGEMENT IN GENERAL OF HAZARDOUS
17 MATERIALS AND HAZARDOUS WASTE AND UNDERGROUND STORAGE
18 TANKS. I JUST DON'T RECALL SPECIFICALLY LOOKING FOR A
19 SAN BERNARDINO CITY SITE IN THIS TARGET AREA. I DON'T
20 RECALL IF ONE EXISTED OR NOT OUTSIDE OF THE CAJON
21 SCHOOL.
22 THERE'S A CAJON HIGH SCHOOL IN THE AREA
23 OF THE NEWMARK WELL FIELD, BUT I DON'T BELIEVE THEY DO
24 ANY BUS MAINTENANCE OR VEHICLE MAINTENANCE. THAT'S
25 ALL DONE AT A SEPARATE FACILITY DOWN ON NINTH STREET

1 AND THE FIFTH STREET AREAS. IF IT HAD BEEN THERE, WE
2 CERTAINLY WOULD HAVE DONE IT. WE DON'T HAVE ANY
3 REASON TO EXCLUDE THEM AT ALL. CITY GOVERNMENT
4 AGENCIES HAVE THE SAME COMPLIANCE PROBLEMS THAT THE
5 INDUSTRY HAS. SO WE DON'T EXCLUDE THEM BY ANY MEANS.
6 Q HAVE YOU HAD ANY INSTANCES WHERE THE
7 CITY OF SAN BERNARDINO HAS BEEN EITHER CITED OR NOTED
8 AS HAVING IMPROPERLY DISPOSED OF HAZARDOUS WASTE OR
9 SUBSTANCES THAT YOU CAN RECALL?
10 A THERE WAS A SIGNIFICANT CASE INVOLVING
11 SEWAGE THAT WAS PRIMARILY THE REGIONAL WATER QUALITY
12 CONTROL BOARD INVESTIGATING SEWAGE MANAGEMENT ISSUES
13 AT THE SAN BERNARDINO WASTEWATER TREATMENT PLANT.
14 Q WHAT CAN YOU TELL ME ABOUT THAT?
15 A THAT IT HAD TO DO WITH RELEASE AND THE
16 REQUIRED REPORTING OF THAT RELEASE AND WHETHER OR NOT
17 REPAIRS WERE MADE.
18 Q DO YOU KNOW IF THAT INVOLVED -- WAS
19 THIS A RELEASE OF SEWAGE?
20 A YES. IT WAS INVESTIGATED BY THE SANTA
21 ANA REGIONAL WATER QUALITY CONTROL BOARD AND THE
22 DISTRICT ATTORNEY'S OFFICE.
23 Q DO YOU KNOW WHAT THE RESULTS OF THAT
24 INVESTIGATION WAS?
25 A I CAN'T REMEMBER IF THE D.A. ACTUALLY

1 FILED THE COMPLAINT OR NOT. BUT IT WAS IN ALL THE
2 NEWSPAPERS. I'M TRYING TO RECOLLECT SPECIFIC
3 INDICATIONS WHERE OUR INSPECTORS HAVE CITED OR ISSUED
4 A NOTICE OF VIOLATION TO THE CITY OF SAN BERNARDINO.
5 IT MAY HAVE HAPPENED. I'M JUST NOT AWARE OF ANY
6 SPECIFIC INSTANCE.
7 AND WE MAKE ANY FILES AVAILABLE TO
8 ANYBODY THAT WANTS TO LOOK AT IT. IF YOU'RE
9 INTERESTED IN ME RECOVERING THAT INFORMATION FROM A
10 FILE, WE CAN CERTAINLY SEARCH FOR IT.
11 Q I'M NOT PERSONALLY FAMILIAR THAT MUCH
12 HOW SEWAGE TREATMENT PLANTS WORK. BUT AS PART OF YOUR
13 JOB AS YOU HAVE DONE IT OVER THE PAST 21 YEARS, DO YOU
14 KNOW IF SOLVENTS ARE USED AT ALL IN SEWAGE TREATMENT
15 PLANTS?
16 A NO, NOT AT ALL.
17 Q THEY'RE NOT?
18 A NO.
19 Q HAVE YOU EVER HEARD THAT PEOPLE --
20 A NOT IN ANY FASHION THAT THEY COULD BE
21 DISCHARGED BECAUSE IT WOULD VIOLATE THEIR WASTEWATER
22 DISCHARGE REQUIREMENTS.
23 Q HOW ABOUT THAT COULD END UP IN THE
24 SLUDGE THAT'S PRODUCED?
25 A IT'S NOT UNCOMMON THAT WASTE -- YOU

1 KNOW, DUMPING STUFF DOWN THE SEWER IS NOT UNCOMMON. I
2 MEAN IT'S -- THAT'S THE TYPE OF BEHAVIOR THAT THE
3 INSPECTORS ON MY STAFF TRY TO PREVENT THROUGH
4 REQUIRING THAT THE BUSINESS PROPERLY MANAGE THEIR
5 HAZARDOUS WASTE.
6 Q AND IF IT IS, THAT COULD POTENTIALLY
7 END UP IN SEWAGE SLUDGE, I PRESUME?
8 A DEPENDING ON THE NATURE OF THE
9 CHEMICAL. SOME CHEMICALS READILY PASS THROUGH IN THE
10 WASTEWATER PHASE AND THEN GO ON TO CONTAMINATE OTHER
11 DOWNSTREAM SOURCE, AND DEPENDING ON THE NATURE OF THE
12 CHEMICALS AFFIXED INTO THE FLOCCULENT, WHICH THEN
13 TURNS INTO THE SLUDGE.
14 SO DEPENDING ON THE SPECIFIC COMPOUND,
15 IT COULD PASS THROUGH COMPLETELY IN AN ENTIRE RANGE
16 ALL THE WAY BACK TO WHERE IT'S COMPLETELY WITHHELD IN
17 THE SLUDGE AND ANY DEGREE THEREIN.
18 Q HOW ABOUT FOR TCE? WOULD THAT LIKELY
19 END UP IN SLUDGE?
20 MS. BOSCO: I'M GOING TO OBJECT TO THIS
21 QUESTION ON FOUNDATION GROUNDS.
22 BUT GO AHEAD AND ANSWER THE QUESTION.
23 THE WITNESS: CONSIDERING THAT IT'S USED TO
24 REMOVE GREASE AND DIRT AND IT DOES IT IN A VERY GOOD
25 FASHION, I WOULD THINK THAT IT WOULD LIKELY PASS

1 THROUGH. BUT I THINK A WASTEWATER TREATMENT PLANT
2 OPERATOR WOULD BE BETTER SUITED TO ANSWER THAT
3 QUESTION, AND THAT WOULD HAVE BEEN EVIDENCED IN THE
4 SAMPLES THAT ARE TAKEN OF THE SLUDGE.
5 THE SAMPLES ARE TAKEN OF THE SLUDGE
6 PRIOR TO BEING DISPOSED OF. I MEAN IT WOULD BE
7 EVIDENCE WHETHER IT WAS THERE OR NOT IN THE SLUDGE
8 JUST FROM THE SAMPLES.
9 BY MR. CARSON:
10 Q DO YOU KNOW IF SAMPLES WERE TAKEN OF
11 SEWAGE SLUDGE IN THE CITY OF SAN BERNARDINO IN THE
12 1960'S AND 1970'S?
13 A NO, I DO NOT KNOW THAT.
14 Q HOW ABOUT IN THE '80S?
15 A WITH EVERYBODY ELSE'S GREATER INTEREST
16 IN ENVIRONMENTAL ISSUES, THAT'S WHEN MOST OF THE
17 INCREASE IN SAMPLING CAME ABOUT. FOR THE SEWAGE
18 SLUDGE, WE DIDN'T HAVE A LOT OF SAMPLING IN THE '50S
19 AND '60S AND EVEN '70S, AND THE SIGNIFICANT GROWTH OF
20 ENVIRONMENTAL SURVEILLANCE OF ENFORCEMENT STARTED IN
21 THE '80S. AND THAT'S WHEN YOU COULD SEE A COROLLARY
22 RISE IN SAMPLING AND ANALYSIS BY BOTH THE REGULATORS
23 AND THE REGULATED.
24 Q TURNING TO THE SEPTIC SYSTEM, HAVE YOU
25 EVER HEARD THAT TCE WAS USED TO CLEAN SEPTIC SYSTEMS?

A YES. IN OUR HOUSEHOLD HAZARDOUS WASTE COLLECTION PROGRAM, WE RUN INTO LITTLE CONTAINERS OF SEPTIC TANK CLEANER, SEPTIC TANK REJUVENATORS, SEPTIC TANK INVIGORATORS THAT HAVE BEEN FOUND TO HAVE TCE AND PCE IN THEM.

Q IN WHAT TIME FRAME ARE WE TALKING ABOUT THAT YOU FOUND THESE?

A WE FIND THEM CURRENTLY. BUT I MEAN PEOPLE CLEAN OUT THEIR GARAGES. THAT'S WHERE WE GET OUR HOUSEHOLD HAZARDOUS WASTE. THEY CLEAN OUT THEIR GARAGES AND BRING THE STUFF IN, AND WE LOOK AT IT.

AND THROUGH NETWORKING, THROUGH OTHER HAZARDOUS WASTE AGENCIES, WE HAVE FOUND OUT, AND TESTING SOME OURSELVES, THAT YEAH, THEY DO HAVE THEM. BECAUSE WE ARE REQUIRED -- WHEN WE DISPOSE OF THEM, WE ARE REQUIRED TO CREATE A WASTE PROFILE. AND SO WE HAVE TO TELL THE RECEIVING HAZARDOUS WASTE FACILITY WHAT'S IN THE WASTE THAT WE ARE SENDING THEM. SO WE HAVE TO CREATE A WASTE PROFILE. SO WE HAVE TO DETERMINE WHAT IS IN THOSE THINGS. AND AS A RESULT OF THAT, WE HAVE RUN INTO CHLORINATED SOLVENTS BEING USED TO, QUOTE, UNQUOTE, CLEAN SEPTIC TANKS.

Q DO YOU KNOW --

A DEGREASING THEM.

Q DO YOU KNOW WHETHER OR NOT THAT WAS A

COMMON PRACTICE, SAY, IN THE 1970'S IN THIS AREA?

A IT WAS AN OVER-THE-MARKET REMEDY. YOU CAN BUY IT IN A HARDWARE STORE. I DON'T KNOW WHAT YOU MEAN BY "COMMON." I DON'T HAVE A -- I DON'T HAVE ANY EXPERIENCE IN OTHER AREAS TO SHOW THAT IT'S RELATIVELY MORE OR LESS THAN, OTHER THAN OUR NETWORKING WITH OTHER HOUSEHOLD HAZARDOUS WASTE AGENCIES ACROSS THE NATION HAVE SAID YEAH, WE HAVE RUN INTO IT TOO. I DON'T HAVE A WAY OF MAKING A RELATIVE STATEMENT AS TO WHETHER IT'S COMMON OR UNCOMMON.

Q DO YOU THINK IT LIKELY THAT IT OCCURRED TO SOME EXTENT IN THE AREA IN THE 1970'S?

A OH, SURE.

Q WERE THERE ANY SEPTIC TANKS IN THE STUDY AREA THAT YOU ALL FOCUSED ON?

A I BELIEVE WE FOUND PROPERTIES ON WHICH THERE HAD BEEN AND WERE SEPTIC TANKS. BUT DID WE TAKE SAMPLES OF THEM, YOU MEAN?

Q WELL, DID YOU MAKE ANY CORRELATION AT ALL BETWEEN THE COMPANIES THAT USE OR DISPOSE OF TCE OR PCE AND THE SEPTIC TANKS?

A OTHER THAN THE FACT THAT WE RECORDED WHETHER THEY WERE -- HAD ANY KNOWLEDGE THAT THEY WERE ON A SEPTIC TANK OR NOT. I DON'T KNOW WHAT YOU MEAN.

Q WELL, I GUESS MY QUESTION IS -- WELL,

TWO QUESTIONS: ONE, FIRST QUESTION IS WERE YOU SUSPICIOUS THAT PEOPLE MAY HAVE BEEN DISPOSING OF TCE OR PCE AS TO A DISPOSAL METHOD INTO THEIR SEPTIC TANK?

A SURE. BECAUSE IF THE SEWER LINE HADN'T GONE TO THAT BUSINESS AT THAT TIME, THAT WAS A LIKELY -- DRY CLEANERS ARE NOTORIOUS FOR DUMPING THEIR PERC IN THE TOILET, WHETHER IT'S CONNECTED TO A SEPTIC TANK OR A SEWER.

Q FOR THE SPECIFIC DRY CLEANERS THAT ARE MENTIONED IN THIS STUDY, WERE YOU ABLE TO CONFIRM THAT THEY DID SO?

A I DON'T RECALL SPECIFICALLY. IT'S NOT SOMETHING THAT SOMEBODY'S GOING TO READILY ADMIT TO WHEN THERE'S AN ENVIRONMENTAL INSPECTOR STANDING THERE.

Q I UNDERSTAND.

A I DON'T RECALL ANY SPECIFIC ASSOCIATIONS.

Q WAS THE RESPONSE TO THIS SURVEY, YOUR DOOR-TO-DOOR SURVEY, WAS THAT VOLUNTARY? DID YOU ALL THREATEN TO TAKE ANY KIND OF LEGAL ACTION IF SOMEBODY DIDN'T PROVIDE YOU THE INFORMATION YOU WERE REQUESTING?

A THAT'S A GOOD QUESTION. THE FACT THAT WE WERE ON AN HISTORIC, FACT-FINDING KIND OF MISSION, WE WANTED TO MAKE SURE THAT THE OPERATOR OR BUSINESS

OWNER PERSON WE TALKED TO HAD SOME DEGREE OF COMFORT IN TALKING TO US ABOUT IT. SO WE PREFACED OUR INSPECTION WITH, "WE'RE HERE AS A FACT FINDING" TO TRY TO GET THEM -- TRY TO USE ANY TECHNIQUE WE COULD TO GET THEM TO OPEN UP, REALIZING THAT WE WERE ENFORCEMENT OFFICERS FOR THE HAZARDOUS WASTE CONTROL LAW.

WE DID NOT SAY, "ANYTHING YOU SAY CAN AND WILL BE USED AGAINST YOU IN A COURT OF LAW," BUT INSTEAD, "DID YOU KNOW THE BUSINESS THAT WAS HERE BEFORE YOU? DO YOU KNOW SOMEONE ELSE THAT MIGHT HAVE DONE THIS SORT OF THING?"

WE TRIED TO GET THEM TO OPEN UP BECAUSE WE WERE MORE IN A FACT-FINDING MODE THAN AN ENFORCEMENT MODE CLEARLY. WE WOULD LET THE ENFORCEMENT TAKE ITS COURSE, BUT WE WANTED TO GET AS MUCH INFORMATION AS POSSIBLE.

Q DO YOU RECALL IF THERE WERE MANY INSTANCES WHERE PEOPLE JUST FLAT OUT REFUSED TO COOPERATE?

A THAT'S NOT UNCOMMON. OR, YOU KNOW, IF WE GOT A FLAT REFUSAL, THEN OBVIOUSLY FROM AN INSPECTOR STANDPOINT, YOU ARE A LOT MORE INTERESTED.

Q SO YOU FOLLOWED UP IN THOSE INSTANCES?

A SURE. THAT'S A HOT LEAD.

Q ON THE THIRD PAGE OF THE STUDY, IT SAYS THAT INFORMATION ON PREVIOUS WASTE MANAGEMENT PRACTICES WAS SKETCHY. DO YOU RECALL WHAT INFORMATION WAS PROVIDED TO THE COUNTY REGARDING THE PREVIOUS WASTE DISPOSAL PRACTICES, OTHER THAN THE ONES THAT WE HAVE KIND OF TALKED ABOUT HERE TODAY?

A NO. THIS COMES FROM THE FACT THAT THE BUSINESS OWNER IS TELLING AN ENVIRONMENTAL ENFORCEMENT PERSON WHETHER OR NOT THEY ILLEGALLY DISPOSED OF A HAZARDOUS WASTE OR NOT. THAT'S WHERE THE SKETCHINESS COMES FROM. WE WERE LOOKING AT WAS IT DUMPED ON THE GROUNDS BEHIND THE BUSINESS? WAS IT DUMPED IN THE TOILET? WAS IT DUMPED IN THE TRASH? WAS IT PICKED UP BY A COMPANY? AND I DON'T RECALL ANY SPECIFICS WITHOUT --

Q LOOKING AT THE FORMS?

A IF WE COULD SEE THE FORMS, IT WOULD CERTAINLY BE HELPFUL.

Q ON THE MAP THAT'S ATTACHED TO THIS, DO YOU KNOW IF THERE'S ANY BETTER OR MORE READABLE COPIES OF THIS MAP IN EXISTENCE? OR HAVE YOU EVER SEEN ONE THAT'S IN COLOR OR LARGER?

A OH, YEAH. AT THE TIME THERE WERE A COUPLE VERSIONS OF DIFFERENT TYPES OF MAPS THAT WERE FLOATING AROUND THAT WERE BIGGER IN SIZE THAN THIS AND

PROVIDED A BIT MORE INFORMATION, IF I RECALL. AND THIS REALLY DOESN'T DEPICT WHERE OUR SURVEY WAS. MOST OF OUR --

Q COULD YOU JUST KIND OF TELL US BY REFERENCE TO THE MAP WHERE THE FOCUS OF THE SURVEY WAS?

A YEAH, WE WERE LOOKING -- DRAWING A RECTANGLE STARTING AT NORTH PARK BOULEVARD --

Q I'LL TELL YOU. IF YOU COULD JUST GO AHEAD. WHILE YOU ARE DOING THAT, PERHAPS JUST DRAW THE RECTANGLE FOR US ON THE EXHIBIT.

A USING THE NORTH PARK BOULEVARD AS A NORTHERN BOUNDARY, PROCEEDING, CREATING A LARGE RECTANGLE IDENTIFIES STATE STREET. I BELIEVE IT'S STATE COLLEGE PARKWAY NOW. BUT STATE STREET DUE SOUTH.

Q GO AHEAD AND JUST MARK IT DOWN.

A JUST DRAW ON THIS ONE?

Q YEAH, SO WE CAN HAVE THAT.

A AND MOVING OVER TO -- IT'S ABOUT -- I BELIEVE WE BOUNDED IT WITH WASHINGTON EAST, AND I THINK WE WENT DOWN TO THE FIFTH STREET AREA.

Q AND YOU HAVE JUST MARKED THOSE AREAS ON THIS EXHIBIT; CORRECT?

A THAT'S CORRECT.

Q MAY I SEE THAT FOR A MINUTE.
A WE FOCUSED ON THE NORTH SAN BERNARDINO AREA.
Q DO YOU KNOW WHERE THE CAJON LANDFILL IS IN RELATION TO THIS MAP?
A SURE.
Q WOULD YOU JUST DRAW IT ON THERE AND JUST MARK IT AS CAJON LANDFILL.
A AND ACTUALLY IN REVIEWING SOME OF THE ADDRESSES, I BELIEVE WE WENT DOWN BELOW HILL STREET ON SOME OF OURS AND ACTUALLY FURTHER OVER TO THE EAST OVER INTO TO THE CITY OF HIGHLAND. SO EXPAND THAT OVER. CAMP ONO WOULD HAVE SAT IN HERE AND THEN THE CAJON LANDFILL. THERE'S THE FREEWAY. THERE'S KENDALL. THE CAJON LANDFILL WOULD SIT SOMEWHERE UP HERE UNDER THE WORDS "LOMA LINDA" ON THE WORDS "LOMA LINDA FAULT."
Q WHERE YOU HAVE JUST DRAWN THAT RECTANGLE?
A IF NOT, SOMEWHERE UP THERE. SOUTH OF CAJON BOULEVARD, BUT QUITE A WAYS NORTH OF A STREET IDENTIFIED AS STATE STREET ON THE MAP. ABOUT OVER THE WORDS "LOMA LINDA" IN THE WORDS "LOMA LINDA FAULT" IDENTIFIED BY A BLACK HASH MARK LINE IDENTIFIED "LOMA LINDA FAULT."

Q OKAY. THANK YOU.
MS. BOSCO: CAN I TAKE A LOOK AT THAT?
MS. RUSHTON: WHICH OF THE TWO AREAS DID YOU IDENTIFY?
THE WITNESS: IT'S HARD TO TELL. I MEAN THE FOOTPRINT OF THE CAJON LANDFILL IS -- I DON'T KNOW WHY IT'S UP TO MY GUESSTIMATING ON A PRIMITIVE MAP WHERE IT IS. IT CAN CLEARLY SHOW THAT I DON'T KNOW WHAT I'M TALKING ABOUT. WE DON'T HAVE A PROPER MAP ON TOP OF IT. BUT IT'S IN THAT GENERAL VICINITY.
MS. RUSHTON: I WAS ONLY ASKING TO SEE IF YOU HAD DESIGNATED ONE OF THE TWO AREAS THERE.
THE WITNESS: IT'S PRETTY ROUGH ON THAT MAP TO, QUOTE, UNQUOTE, IDENTIFY IT.
BY MR. CARSON:
Q I JUST WANTED AN IDEA.
A AND THE HISTORIC LOCATION OF CAMP ONO IS IN BETWEEN IT AND THE CITY OF SAN BERNARDINO. I SPOKE EARLIER OF CAMP ONO, AND IT SITS IN BETWEEN THE LANDFILL AND THE CITY OF SAN BERNARDINO.
Q IF YOU COULD TURN TO TABLE ONE. TABLE ONE IS A LIST OF CURRENT USERS OF TCE/PCE: IS THAT CORRECT?
A YES, THAT'S WHAT IT'S IDENTIFIED AS.
Q DO YOU KNOW HOW MANY OF THESE

BUSINESSES ARE STILL IN OPERATION?
A NOT, SPECIFICALLY. NO, SIR. BUT THE RECORDS ARE AVAILABLE.
Q IN YOUR WORKING WITH THE COUNTY, HAVE YOU HAD ANY DEALINGS WITH ANY OF THESE BUSINESSES THAT YOU CAN RECALL? BY "YOU," I MEAN THE COUNTY.
A YOU MEAN DID I GET MY CLOTHES DRY-CLEANED BY ONE OF THEM?
Q I MEAN COUNTY, THE DEPARTMENT.
A I DON'T REMEMBER ANY SPECIFIC CASES THAT WE WERE INVOLVED IN ANYTHING SPECIFIC.
Q WOULD YOU HAPPEN TO KNOW IF ANY OF THESE BUSINESSES RELIED UPON THE CITY OF SAN BERNARDINO FOR WASTE DISPOSAL PICKUP?
A FOR WASTE DISPOSAL PICKUP, NO.
Q TRASH PICKUP?
A OH, TRASH PICKUP. I'M SORRY. I GOT FOCUSED ON TCE AND PCE. FOR SOLID WASTE DISPOSAL, I DON'T KNOW SPECIFICALLY IF THEY WOULD USE SAN BERNARDINO CITY SOLID WASTE DISPOSAL OR NOT. THERE ARE SEVERAL WASTE HAULERS, AND I DON'T -- SOME OF THEM MIGHT BE SERVICED BY THE CITY OF HIGHLAND. THERE'S ONE ON BASELINE THAT MIGHT BE SERVICED. I THINK IT'S BY JACK'S OUT IN HIGHLAND.
BUT IT WOULD APPEAR AS THOUGH MOST OF

THEM PROBABLY WOULD GET SAN BERNARDINO CITY. I MEAN THAT'S DEFINED BY THE SPHERE THAT SAN BERNARDINO CITY SERVES. WE JUST HAVE TO PLOT THEM ON THE MAP AND FIND OUT IF THEY ARE SAN BERNARDINO SOLID WASTE DISPOSAL OR NOT.
Q SINCE YOU HAVE LIVED IN THIS AREA FOR SOME TIME, YOU MIGHT KNOW THE ANSWER TO THIS QUESTION. YOU HAVE DRAWN OUT AREA FIVE ON THE MAP, AND THAT IS IN SOME PROXIMITY TO THE CAJON LANDFILL.
A UH-HUH.
Q WOULD YOU HAPPEN TO KNOW WHETHER THE LANDFILL WOULD HAVE SERVICED THAT AREA? IN OTHER WORDS --
A WOULD I HAPPEN TO KNOW?
Q IN OTHER WORDS, DURING THE LIFETIME THAT THE LANDFILL WAS IN OPERATION, WOULD YOU HAPPEN TO KNOW WHETHER IT WAS AVAILABLE FOR THAT AREA OF THE CITY?
A IT WAS PROBABLY THE PRIMARY LANDFILL FOR THAT AREA AND PROBABLY THE PRIMARY LANDFILL FOR ALL THE PLACES IDENTIFIED ON TABLE ONE.
Q IF YOU WOULD TAKE A LOOK AT TABLE THREE, PLEASE.
A OKAY.
Q TABLE THREE IS POSSIBLE PAST USERS OF

PCE AND TCE. AND I'LL JUST HAVE TO KIND OF POINT TO YOU. IN THE LEFT-HAND COLUMN ABOUT A LITTLE MORE THAN MAYBE THREE QUARTERS OF THE WAY DOWN, IT LISTS S.B. CITY GARAGE AT 182 SOUTH SIERRA WAY.
DO YOU HAPPEN TO KNOW WHETHER OR NOT THAT IS A CITY OF SAN BERNARDINO GARAGE?
A IT WOULD LIKELY BE THE GARAGE THAT SERVICES CITY VEHICLES, YEAH. I DON'T KNOW FOR SURE. BUT IT'S CERTAINLY WHAT IT LOOKS LIKE. I MEAN OUR NORMAL NOMENCLATURE THAT WE WOULD USE, S.B. WOULD MOST LIKELY BE SAN BERNARDINO.
MR. CARSON: LET'S JUST TAKE A VERY QUICK BREAK AND LET ME CONFER WITH MY COLLEAGUES HERE. WE MIGHT BE ABLE TO WRAP THIS UP.
(RECESS.)
BY MR. CARSON:
Q AT THE BOTTOM OF PAGE 2 OF THIS STUDY OF EXHIBIT 713, IT TALKS ABOUT MOST CURRENT AUTO REPAIR SHOPS USING SAFETY-KLEEN SOLVENT DEGREASING METAL PARTS, AND IT SAYS THAT SAFETY-KLEEN HAS PROVIDED SERVICE IN THIS AREA SINCE 1975; IS THAT CORRECT?
A UH-HUH. SURE.
Q HOW DO WE KNOW THAT SAFETY-KLEEN HAS BEEN IN THE AREA SINCE '75?

A BOTH THROUGH DISCUSSIONS WITH THE SAFETY-KLEEN FOLKS AND THEN DISCUSSIONS WITH THE BUSINESSES. AND WHEN YOU GO INTO A BUSINESS AND A BUSINESS HAS BEEN PAYING FOR A SERVICE, IT'S THE TOTAL OPPOSITE OF WHEN THEY HAVEN'T BEEN PAYING FOR ONE. AND THEY'RE MORE THAN HAPPY TO PRODUCE THE RECEIPTS AND MAKE THE STATEMENT THAT SAFETY-KLEEN PICKS UP OUR SOLVENT AND WE HAVE RECEIPTS FOR PAYING THEM.
SO THERE'S INFORMATION THERE AS OPPOSED TO TRYING TO PROVE THE ABSENCE OF INFORMATION. SO THEY WILL EITHER PULL OUT THEIR RECEIPTS OR THEY MENTION THEIR SALES REP. AND SAFETY-KLEEN IS PRETTY COOPERATIVE IN LETTING US KNOW WHO IS ON THEIR SYSTEM AND WHO IS NOT.
Q AND BEFORE '75, WHAT WERE MOST AUTO REPAIR SHOPS USING IN TERMS OF SOLVENTS?
A IN TERMS OF SOLVENTS?
Q UH-HUH. DEGREASING SOLVENTS.
A DEGREASING SOLVENTS. EITHER TCE, PCE, METHYLENE CHLORIDE, GASOLINE. ALL SORTS OF THINGS ARE USED FOR DEGREASING.
Q WE TALKED ABOUT THE CAT PIT A COUPLE TIMES AND THAT YOU ALL DIDN'T DO -- OTHER THAN LOOKING AT THE AERIAL PHOTOGRAPHS -- MUCH OF AN HISTORICAL INVESTIGATION WITH RESPECT TO THE CAT PIT.

AND MY QUESTION IS IF YOU SAY YOU WERE GOING TO DO AN HISTORICAL INVESTIGATION OF THE CAT PIT TO FIND OUT MORE ABOUT IT, WHAT KINDS OF THINGS WOULD YOU DO AND WHAT KINDS OF INFORMATION WOULD YOU LOOK FOR?

A WELL, THAT'S A PRETTY DIFFICULT ONE BECAUSE SINCE THERE'S NO REAL FACILITY THERE. FIRST, WE WOULD TRY TO FIND RECORDS OF EMPLOYEES AND TRY TO FIND THE EMPLOYEES AND TRY FORMER EMPLOYEES AND TRY TO INTERVIEW THEM. AND TO SOME EXTENT THAT WAS DONE BY OTHER AGENCIES OUT AT CAMP ONO. AND I DON'T KNOW TO WHAT EXTENT IT WAS DONE THERE.

OTHER METHODOLOGIES, IF WE WERE REQUESTED TO DO IT TODAY AND HAD SOME MONEY TO DO IT, WE WOULD DO SOME PHYSICAL SAMPLING OF THE AREA, TAKING SAMPLES, SOIL SAMPLES, CORE SAMPLES AND ANALYZING THOSE.

Q CAN YOU THINK OF ANYONE THAT YOU KNOW OF IN COUNTY -- AND I KNOW THAT IT'S GOING BACK A NUMBER OF YEARS. BUT ANYONE THAT YOU KNOW OF WHO MIGHT HAVE INFORMATION ABOUT THE CAT PIT?

A NO. THERE WERE OTHER AGENCIES INVOLVED IN THIS PROCESS, AND EITHER THE DTSC OR THE REGIONAL BOARD MAY HAVE FOLLOWED UP ON THAT OR THE EPA. BECAUSE, AS I MENTIONED BEFORE, WE WERE JUST A SMALL

PART OF THE WHOLE INVESTIGATION.

Q HAVE YOU EVER LEARNED ANYTHING ABOUT THE CAT PIT TO MAKE YOU THINK THAT IT IS NOT A LIKELY CONTRIBUTOR OF TCE OR PCE TO THE NEWMARK PLUME?

A NO. MOST OF THE INDICATIONS WHICH I LOOKED AT, LIKE THIS LIST OF LEVELS OF CONTAMINATION, YOU KNOW, ACTUALLY POINT BACK TO IT, ON PAGE 616, THE MAP AND THE TCE AND PCE LEVELS THAT ARE INDICATED COMING OUT OF THE DIFFERENT WELLS.

Q AND YOU ARE REFERRING TO THE MAP AT THE BACK OF THIS EXHIBIT?

A THE LAST PAGE, U.S. EXHIBIT PAGE 616.

Q IT HAS FOUR COLUMNS ON THE LEFT-HAND SIDE OF THE MAP; CORRECT?

A YES, WELLS, DATE, TCE, PCE.

Q AND THE READINGS THEN UNDER TCE AND PCE WOULD BE THE READINGS ON THOSE SPECIFIC WELLS ON THE DATES THAT ARE LISTED UNDER THE DATE COLUMN?

A THAT'S CORRECT.

Q YOU TALKED ABOUT PROVIDING FOR DISPOSAL OF HOUSEHOLD HAZARDOUS WASTE. WHEN DID THE COUNTY START PROVIDING THAT?

A ABOUT 1984 WE STARTED PROVIDING IT IN THE CITY OF SAN BERNARDINO.

Q AND WHAT WAS AVAILABLE BEFORE THAT

TIME?

A NOTHING. TO MY KNOWLEDGE, ANYWAY.

Q IS IT LIKELY THAT PEOPLE JUST PUT THEIR HOUSEHOLD HAZARDOUS WASTE OUT IN THE TRASH AT THAT TIME?

A THE WHOLE IDEA FOR HOUSEHOLD WASTE MANAGEMENT, THE FOUNDATION OF IT IS TO PROVIDE AN OPPORTUNITY FOR IT TO BE REMOVED FROM THE SOLID WASTE STREAM. AND IT'S ACTUALLY FOUND IN THE PUBLIC RESOURCES CODE IN THE STATE OF CALIFORNIA, WHICH IS WHERE YOU FIND ALL OF THE SOLID WASTE MANAGEMENT RELATED STATUTES. YOU CLEARLY TAKE IT OUT OF THE SOLID WASTE STREAM. THAT'S WHY WE ARE THERE.

Q AND BEFORE YOU DID THAT, IT WAS LIKELY IN THE SOLID WASTE STREAM?

A OH, YEAH.

Q HAVE YOU EVER HEARD THE TERM "PETROLEUM DISTILLATES" USED IN THIS AREA?

A YES.

Q WHAT IS YOUR UNDERSTANDING OF WHAT PETROLEUM DISTILLATES CONSISTS OF?

A JUST AS IT STATES. PETROLEUM DISTILLATES TYPICALLY IN OUR BUSINESS IS ASSOCIATED WITH -- WHEN YOU HEAR PETROLEUM DISTILLATES, TYPICALLY YOU ARE TALKING ABOUT SOMEBODY WHO IS GOING TO BE

DEGREASING. A LOT OF TIMES PETROLEUM DISTILLATES IS ASSOCIATED -- WE TYPICALLY SEE IT ASSOCIATED WITH CLEANING, DEGREASING ACTIVITIES, STUD CARD SOLVENT, EARLIER SAFETY-KLEEN.

Q HOW ABOUT BEFORE SAFETY-KLEEN? HAVE YOU EVER HEARD IT REFERRED TO AS INCLUDING CHLORINATED SOLVENTS?

A PETROLEUM DISTILLATES?

Q YES.

A YES. USUALLY PETROLEUM DISTILLATES IS USED -- WHEN YOU SAY PETROLEUM DISTILLATES, YOU ARE USUALLY THINKING OF THINGS EXCLUSIVE OF CHLORINATED SOLVENTS. USUALLY MOST PEOPLE SAY CHLORINATED SOLVENTS OR PETROLEUM DISTILLATES.

Q DO YOU KNOW IF THAT --

A USUALLY THEY ARE NOT INCLUSIVE OF EACH OTHER. USUALLY.

Q DO YOU KNOW IF THAT WOULD HAVE BEEN TRUE IN THE EARLY 1960'S AS WELL?

A I DON'T BELIEVE IN THE EARLY 1960'S PEOPLE MADE MUCH OF THE FACT THAT CERTAIN CHEMICALS WERE CHLORINATED OR NOT CHLORINATED. I DON'T THINK THE ISSUE OF CHLORINATED HYDROCARBONS AND THE HEALTH EFFECTS RELATED THERETO CAME ABOUT UNTIL THE LATE '70S AND EARLY '80S, WHEN YOU SEE THAT CARBON TET WAS

REPLACED WITH PERC IN DRY CLEANERS.

Q SO SOMEONE REFERRING TO PETROLEUM DISTILLATES IN THE EARLY 1960'S MAY HAVE BEEN AT THAT TIME REFERRING TO CHLORINATED SOLVENTS?

A MAY HAVE. SURE. IT DEPENDS ON HOW THEY BOUGHT IT, WHO THEY BOUGHT IT FROM. WE HAVE ALREADY DISCUSSED THE FACT THAT YOUR SEPTIC TANK, YOUR CHLORINATED SEPTIC TANK ELIXIR, IF YOU WILL, NEVER MENTIONED CHLORINATED SOLVENTS. I MEAN IT WAS -- JUST WASN'T AS SIGNIFICANT TO A HEALTH RISK IN THE ENVIRONMENT AS IT IS NOW.

Q DO YOU KNOW OF ANY BUSINESSES IN THIS AREA THAT WOULD HAVE GENERATED LARGE QUANTITY DRUMS OF WASTE PETROLEUM DISTILLATES IN THE EARLY 1960'S?

A DRUMMED VOLUMES?

Q YES.

A OUTSIDE OF THE FEDERAL GOVERNMENT OR --

Q ANYONE.

A IN THIS AREA, DRUMMED VOLUMES OF WOULD BE A PRETTY SIGNIFICANT SIGHT.

Q I'LL TELL YOU EXACTLY WHAT I'M GETTING AT, AND WE'LL GET INTO THIS WITH OTHER WITNESSES AS WELL. BUT THERE'S A LETTER THAT WAS DRAFTED IN 1965 WHICH INDICATES THAT THE CITY OF SAN BERNARDINO HAD SENT DRUMMED QUANTITIES OF WHAT WAS CALLED PETROLEUM

DISTILLATES TO THE CAJON LANDFILL.

BASED UPON YOUR KNOWLEDGE OF THE USE OF PETROLEUM DISTILLATES IN THIS AREA, WOULD YOU BE ABLE TO HAZARD AN OPINION AS TO WHERE THAT MAY HAVE COME FROM?

A NO. IT'S ABSOLUTE NEWS TO ME. DRUMMED VOLUMES OF PETROLEUM DISTILLATES GOING INTO THE CAJON LANDFILL?

Q UH-HUH.

A YEAH, THAT'S -- UNLESS MY MEMORY IS REALLY BAD, THAT'S PRETTY SHOCKING. I MEAN THAT'S -- THAT'S -- THAT'S EVEN FOR THE '60S.

Q WHY IS IT SHOCKING?

A YOU JUST DON'T HEAR THAT TYPE OF THING TODAY. I MEAN THE FACT THAT PEOPLE HAULED DRUMMED WASTES TO A LANDFILL, YOU HAVE TO KIND OF FRAME IT IN THE MENTALITY OF THE '60S, BUT THAT'S A LOT OF DRUMMED LIQUIDS GOING TO THE LANDFILL.

Q YOU HAVE NEVER HEARD ANYONE FROM THE COUNTY DISCUSSING THAT?

A NO. NO.

Q IF IT'S TRUE, THOUGH, THAT THAT QUANTITY OF PETROLEUM DISTILLATES WERE TAKEN TO CAJON BY THE CITY OF SAN BERNARDINO, WOULD YOU HAVE ANY IDEA WHERE THAT SUBSTANCE MAY HAVE DERIVED FROM?

A NO.
MS. BOSCO: OBJECTION TO THE FORM OF THE QUESTION.
THE WITNESS: SORRY.
MR. CARSON: THE ANSWER IS NO?
THE WITNESS: WHAT DO I DO, BOSS?
MR. JOCKS: YOU CAN ANSWER.
THE WITNESS: I DON'T KNOW WHERE IT WOULD HAVE COME FROM IN THE CITY. IF IT WAS GENERATED BY THE CITY. I DON'T KNOW WHERE IT WOULD HAVE COME FROM FROM THE CITY. I MEAN NORTON AIR FORCE BASE HAD HUGE VOLUMES THAT THEY WERE USING, WHY IT WOULDN'T HAVE SHOWN UP IN THE SWATS. BUT WHAT THE CITY WAS DOING WITH IT WOULD BE --
BY MR. CARSON:
Q NORTON?
A -- CURIOUS.
Q NORTON AIR FORCE BASE HAD A LARGE VOLUME OF WHAT THEY WERE USING?
A EVERYTHING. THEY HAD LARGE VOLUMES OF SOLVENTS, OF ALL SORTS OF CLEANING CHEMICALS. THEY WERE A MAJOR HUB FOR THE MILITARY IN THE VIETNAM ERA.
Q HAVE YOU EVER HEARD THE TERM PETROLEUM DISTILLATES SPECIFICALLY USED WITH RESPECT TO ANYTHING THAT CAME OUT OF NORTON?

A NORTON. I COULDN'T IMAGINE THAT IT WAS NOT AT NORTON.
Q WELL, THAT WASN'T EXACTLY MY QUESTION.
A DO I SPECIFICALLY? I CAN'T RECOLLECT SPECIFICALLY SEEING PETROLEUM DISTILLATES ASSOCIATED WITH NORTON SPECIFICALLY. BUT LIKE I SAID --
Q WOULD YOU HAPPEN TO KNOW WHEN NORTON BEGAN OPERATIONS HERE?
A MID 40'S.
Q YOU HAVE READ OVER THIS REPORT BEFORE TODAY; CORRECT? BEFORE THIS DEPOSITION, I UNDERSTOOD YOU TO SAY THAT YOU READ THIS REPORT OVER.
A YOU MEAN IN RECENT?
Q YEAH.
A I SAID THIS MORNING THAT THIS IS THE FIRST TIME I HAVE SEEN IT IN MANY, MANY YEARS. BUT I WAS INVOLVED IN THE CREATION OF IT. BUT I HAVEN'T HAD CAUSE TO LOOK AT IT IN MANY, MANY YEARS.
Q HAVE YOU TAKEN A BIT OF A LOOK AT IT THIS MORNING?
A YES. SURE.
Q IS THERE ANYTHING HERE THAT YOU THINK IS INACCURATE IN ANY WAY NOW THAT YOU REVIEWED IT?
A WELL, I HAVEN'T HAD TIME TO COMPLETELY REVIEW IT. BUT AT THE TIME THAT IT WAS CREATED, I

BELIEVED IT WAS ACCURATE TO WHAT WE WERE DOING AND WHAT OUR MISSION AND INTENT WAS, YES. IT WAS COMING OUT OF MY OFFICE AND REPRESENTING THE WORK THAT WE HAD DONE. SO I BELIEVE IT TO BE QUITE ACCURATE AND AS COMPLETE AS WE COULD PUT IT TOGETHER. AND IT WAS A PART OF OTHER WORK THAT WAS BEING DONE IN THE ENTIRE REGION BY THE REGIONAL BOARD, DTSC, FED, EPA. AND WE HAD NO REASON TO INCLUDE OR EXCLUDE ANYBODY FROM THE REPORT.
Q I JUST THOUGHT OF A COUPLE MORE QUICK QUESTIONS. ARE YOU FAMILIAR WITH A BUSINESS CALLED CARGILL, INCORPORATED?
A YES.
Q TO YOUR KNOWLEDGE, HAVE THEY USED PCE AND TCE IN THE PAST?
A I CAN'T RECALL RIGHT NOW WHETHER THEY DID OR NOT. WITHOUT LOOKING IN HERE, I DON'T KNOW IF WE LOOKED AT THEM OR NOT.
Q WE CAN LOOK TO SEE IF THEY ARE LISTED. I DON'T SPECIFICALLY RECALL.
A THEY MIGHT HAVE BEEN LISTED UNDER A DIFFERENT NAME.
Q COULD YOU JUST TAKE A LOOK AT THE TABLES TO SEE IF YOU SEE THEM. I THINK THEY ARE IN ALPHABETICAL ORDER.

A I DON'T SEE CARGILL LISTED AS SUCH, BUT I BELIEVE WE TALKED ABOUT IT. I DON'T KNOW IF THEY WERE OUT OF BUSINESS AT THE TIME WE DID THIS OR NOT, BUT I DO REMEMBER, SINCE THEY WERE IN AN AREA THAT WE WERE INTERESTED IN. I DON'T KNOW WHY THEY WOULDN'T HAVE BEEN LOOKED AT.
I'M JUST LOOKING FOR A NAME THEY MIGHT HAVE USED OR WE MIGHT HAVE PUT THEM UNDER. I DON'T SEE ANY REFERENCE TO THEM ON HERE. JUST SCANNING IT, I DON'T SEE THEIR STREET ADDRESS ON HERE. BUT THEY WOULD HAVE BEEN -- I BELIEVE THEY WERE CLOSE ENOUGH TO HAVE BEEN INCLUDED IN OUR TARGET AREA.
Q IN SOME OF THE REPORTS THAT HAVE BEEN GENERATED BY THE COUNTY'S ENGINEERING CONSULTANTS REGARDING THE CAJON LANDFILL, I HAVE SEEN A REFERENCE TO AN OLD STEEL MILL NEAR CAJON. HAVE YOU EVER HEARD ANYTHING ABOUT AN OLD STEEL MILL OUT NEAR CAJON AREA?
A THERE'S AN INDUSTRIAL PARKWAY THAT'S OUT THERE THAT HAD A FLAT ROLLING MILL AND SOME OTHER BUILDINGS THAT ARE OUT THERE THAT WERE USED FOR INDUSTRIAL PURPOSES.
Q HAS THE COUNTY EVER LOOKED AT THAT AS A POSSIBLE SOURCE OF TCE OR PCE, TO YOUR KNOWLEDGE?
YOUR DIVISION, THAT IS.
A THEY HAVE BEEN INSPECTED, AND I BELIEVE

WE ACTUALLY DID A CLEANUP OUT THERE OR HAVE NOTIFIED THE PROPERTY FOR CHROME CONTAMINATION, BUT WE HAVE DONE OTHER WORK IN THOSE AREAS.
Q IS THIS AN ABANDONED MILL OR IS THIS AN ONGOING --
A I'M TRYING TO REMEMBER.
Q -- CURRENTLY USED MILL? BECAUSE THE REFERENCE I HAVE SEEN WAS TO AN ABANDONED MILL IS TO WHAT I WAS SPEAKING TO.
A I BELIEVE AT THIS TIME IT IS ABANDONED, AND THERE WAS SOIL WORK DONE ON IT. AND I DON'T RECALL IF WE SPECIFICALLY INCLUDED OR EXCLUDED TCE OR PCE. BUT I BELIEVE THERE IS WORK THAT WAS DONE ON IT INITIALLY TO CLEAN THE SITE UP UNTIL IT BECAME FURTHER ABANDONED.
Q DO YOU RECALL IF DRUMS OF -- DRUMS MARKED TCE WERE FOUND THERE?
A NO, I DON'T RECALL. I DO NOT RECALL THAT.
Q ABOUT WHAT TIME FRAME WOULD THIS CLEANUP THAT YOU HAVE MENTIONED HAVE OCCURRED?
A IT WOULD HAVE BEEN IN THE LATE '80S. IT WOULD BE AVAILABLE BY FILE. WE HAVE A FILE ON IT.
Q ON TABLE TWO UNDER CONFIRMED PAST USERS OF TCE/PCE, IT LISTS CAMP ONO. AND YOU HAD TESTIFIED

BEFORE THAT THE FACILITY WAS NOT THERE WHEN THIS REPORT WAS DONE, THAT YOUR STUDY WAS ONGOING, AND THAT YOU LOOKED AT AERIAL PHOTOGRAPHS. HOW DID YOU CONFIRM CAMP ONO TO BE A PAST USER OF TCE OR PCE?
A I DON'T RECALL THE SPECIFICS WHY IT WAS. IT COULD HAVE BEEN AN INTERVIEW WITH A FORMER EMPLOYEE. IT COULD HAVE BEEN THROUGH CAMP RECORDS. I DON'T RECALL THE SPECIFIC REASON WHY IT WAS IDENTIFIED.
Q AT THE END OF THAT TABLE TWO, THE LAST LIST IS THE CAT PIT, AND IT SAYS NORTON AIR FORCE BASE. IS THAT THE SAME CAT PIT THAT YOU HAVE REFERRED TO IN YOUR TESTIMONY TODAY?
A NO, THE CAT PIT, WHENEVER I HAVE REFERRED TO THE CAT PIT, HAS ALWAYS BEEN IN THE AREA THAT I HAVE IDENTIFIED THAT'S SEPARATED BY NORTON AIR FORCE BASE BY SEVERAL MILES. AND NORTON AIR FORCE BASE IS IDENTIFIED ON YOUR MAP ON PAGE 616 AS A GRAY AREA TO THE SOUTH.
Q OKAY. I SEE IT NOW.
A SO YOU CAN SEE THAT IT IS DISTINCT FROM THE AREA IDENTIFIED AS THE CAT PIT. I'M UNFAMILIAR AS TO WHERE A CAT PIT WAS ON NORTON.
Q THE OTHER CAT PIT THAT WE HAVE REFERRED TO THEN DOES NOT OCCUR ON THIS LIST?

A IT DOESN'T APPEAR, NO.
Q DO YOU KNOW WHY THAT WOULD HAVE BEEN?
A I THINK IT GOES BACK TO THE ISSUE OF WE DIDN'T -- WE DIDN'T CONFIRM IT. WE DIDN'T HAVE ANY OTHER -- WE DIDN'T HAVE ANY INFORMATION RELATED TO PEOPLE THAT WE COULD OBTAIN SPECIFICALLY DUMPING IN THE CAT PIT.
I THINK I SAID BEFORE THAT WE HAD DIFFICULTY. THERE'S NO FACILITY THERE. THERE'S NO PEOPLE THERE. THERE'S JUST THE FACT THAT PEOPLE SAID, "OH, YEAH, WE USED TO HAVE A PIT THERE."
Q IT WAS WORD OF MOUTH?
A I DON'T KNOW WHY WE DIDN'T SPECIFICALLY LIST THE CAT PIT IN NORTH SAN BERNARDINO AS A CONFIRMED SITE.
Q AND IT'S NOT ON THE TABLE THREE, POSSIBLE PAST USERS OF TCE AND PCE, EITHER, IS IT?
A I DON'T BELIEVE SO, NO.
Q WITH RESPECT TO THE CAT PIT AGAIN, GIVEN THAT THE INFORMATION IS WORD OF MOUTH, ARE YOU SURE ABOUT WHEN THE CAT PIT WAS OPERATIONAL?
A AM I SURE ABOUT IT? NO.
Q THE TIME FRAMES?
A NO.
Q WOULD YOU KNOW ANY COUNTY EMPLOYEES --

BE THEY PAST EMPLOYEES, PRESENT EMPLOYEES -- WHO MAY HAVE WORKED AT THE CAJON LANDFILL IN THE '60S OR '70S OR WHO MAY HAVE KNOWLEDGE ABOUT THE CAJON LANDFILL FROM THAT TIME PERIOD?
A I DON'T RECALL SPECIFICALLY ANYBODY WHO WOULD HAVE WORKED UP THERE.
Q WOULD YOU KNOW OF ANY PAST OR PRESENT EMPLOYEES WHO MAY HAVE BEEN INVOLVED IN TAKING WASTE TO CAJON OR --
A NOT SPECIFICALLY. IT WAS A COUNTY OPERATION, AND LOTS OF SOLID WASTE WENT UP THERE.
Q IT'S JUST DIFFICULT FOR THAT TIME PERIOD FOR US TO -- YOU KNOW, IF WE WANTED TO TALK TO SOMEBODY, TO FIND PEOPLE TO TALK TO BECAUSE WHO KNOWS WHO THEY WERE. THAT'S THE REASON WE'RE ASKING.
A I DON'T KNOW WHY. ONE OF THE REASONS -- YOU MENTIONED THE CAT PIT ISN'T SPECIFICALLY ON HERE -- IF YOU LOOK AT THE PROGRESSION OF HOW THINGS WERE DONE, WE WERE PRESENTED WITH CONTAMINATION HEADING IN A SOUTHWARD MOTION AND FROM NORTH SAN BERNARDINO TO SOUTH SAN BERNARDINO, AND WE WERE GIVEN INFORMATION THAT THE WELLS AROUND THE CAT PIT WERE HIGH. I MEAN, THAT'S KIND OF WORKING. WE DIDN'T PRINT IT BECAUSE THAT WAS KIND OF OUR STARTING. THE CONTAMINATION IS HIGH AROUND THESE AREAS. CAN YOU FIND ANYBODY WHO IS

CONTRIBUTING AROUND IT? SO WE'RE FOCUSING ON THOSE WHO MIGHT HAVE CONTRIBUTED AROUND IT WITH THE FACT THAT THE CONTAMINATION AT THOSE WELLS WAS THE HIGHEST OF ANY THAT WE COULD FIND.
SO I KNOW IT'S CONSPICUOUS BY ITS ABSENCE, BUT IT'S KIND OF A -- IT WASN'T THE FOCUS OF THE STUDY. IT WAS JUST PRESUMED THAT THAT WAS A -- IT WAS HIGHLY CONTAMINATED, PARTICULARLY COMPARED TO THE OTHER WATER SAMPLES THAT WERE BEING DONE AT THE TIME.
Q AND, IN FACT, THE CAT PIT IS REALLY NOWHERE DISCUSSED IN THIS REPORT.
A NOT REALLY, NO. BECAUSE WE WERE JUST TRYING TO -- AS I STATED, IN THE ORIGINAL REDLANDS, THE REPORT. THE FOLKS THAT WERE ORIGINALLY NAMED BY THE REGIONAL BOARD WERE RATHER VOCIFEROUS IN THE DENIAL THAT THEY WERE THE ONLY CONTRIBUTORS TO THE REDLANDS PLUME, WHICH GOT ME GOING. OH, LET'S GO FIND OUT WHO ELSE COULD HAVE CONTRIBUTED TO IT.
SO THE SAME KIND OF MENTALITY IS USED HERE. LET'S GO FIND OUT WHO ELSE COULD BE CONTRIBUTING TO IT. AND WE JUST DIDN'T COME UP WITH A LOT OF RELATIONSHIPS.
Q WE UNDERSTAND THAT TO THE WEST OF WHERE YOU HAVE SHOWN THE CAT PIT TO BE LOCATED, THERE'S AN OLD ABANDONED AIRPORT FACILITY.

A TO THE WEST?
Q UH-HUH. DO YOU HAVE ANY KNOWLEDGE ABOUT THAT?
A TO MY KNOWLEDGE, THE RUNWAY RAN -- I'M TRYING TO RECOLLECT NOW. BUT THE RUNWAY, THE EASTERN END OF THE RUNWAY IS WHERE THE CAT PIT WAS. AND CURRENTLY IT'S -- THIS WHOLE AREA IS COMPLETELY DEVELOPED WITH HOUSING AND APARTMENTS AND RESIDENTIAL AND COMMERCIAL USES.
BUT IF I REMEMBER, WE SAW -- YOU COULD SEE THE EAST/WEST RUNWAY, AND THEN THE EQUIPMENT ACCUMULATION AREA, SLASH, CAT PIT, AT THE EASTERN END OF THAT RUNWAY.
Q WHOSE RUNWAY WAS THAT?
A I BELIEVE IT WAS SOME FORM OF ARMY AIR CORPS OR MILITARY FEDERAL AIRPORT.
Q AND YOUR BELIEF IS BASED UPON WORD OF MOUTH?
A YEAH. I DON'T HAVE ANY DOCUMENTATION OF IT THERE. EVERYBODY JUST SAID, "ISN'T THAT THE OLD ARMY AIR STRIP UP THERE?" WHATEVER, AND THOUGHT IT WAS USED IN ASSOCIATION WITH CAMP ONO.
MR. CARSON: OKAY. I DON'T HAVE ANY MORE QUESTIONS. THANK YOU VERY MUCH. SOME OF THE OTHER ATTORNEYS MAY.

MS. BOSCO: DO YOU HAVE ANY QUESTIONS?
MR. JOCKS: I DON'T HAVE ANY QUESTIONS.
MS. BOSCO: I HAVE A FEW.

EXAMINATION

BY MS. BOSCO:
Q MR. BRIERTY, JUST TO FOLLOW UP ON WHAT YOU WERE JUST SAYING, I WANT TO BE CLEAR ON THE RECORD ABOUT ALL THE CAT PITS OR THE TWO CAT PITS HERE.
LET'S START WITH THE ONE YOU WERE JUST REFERRING TO ON THE MAP. IT IS MY UNDERSTANDING THAT THIS EAST/WEST RUNWAY THAT STOPS, THAT CAT PIT WAS AT AN ARMY AIRPORT OR OTHER FEDERAL INSTALLATION.
A AS I THOUGHT IT IDENTIFIED ON THE MAP BY THE NEWMARK 1, 2, 3, 4, WELL FIELD.
Q AND, AGAIN, IF WE CAN GO BACK TO TABLE TWO, THE CONFIRMED PAST USERS OF TCE AND PCE, DO YOU RECALL WHY THE CAT PIT AT NORTON AIR FORCE BASE APPEARS ON THIS LIST?
A NO, NOT SPECIFICALLY. AND, AGAIN, YOU KNOW, I HAVEN'T SEEN THAT IN MANY YEARS, AND I DON'T RECALL THE DETAILS. BUT THERE COULD HAVE WELL BEEN A CAT PIT AT NORTON.
Q DO YOU RECALL INFORMATION ABOUT WHY

NORTON AIR FORCE BASE ITSELF WAS LISTED AS A CONFIRMED PAST USER OF TCE/PCE ON TABLE TWO?
A I WOULD THINK THAT IT WAS -- WE MUST HAVE HAD A LOT OF INFORMATION ABOUT NORTON AIR FORCE BASE HAVING TCE AND PCE IN THE COURSE OF THEIR BUSINESS OF CLEANING AIRPLANES, LARGE QUANTITIES OF AIRPLANES. AGAIN, I COULDN'T IMAGINE THAT THEY WOULDN'T HAVE TCE AND PCE AS A COMMON SOLVENT THERE.
Q DO YOU RECALL WHETHER THAT INFORMATION CAME FROM DOCUMENTS OR INTERVIEWS OF PEOPLE WHO HAD WORKED AT NORTON?
A I DON'T KNOW SPECIFICALLY. WE TRIED TO FOCUS ON THE CONFIRMED AREAS OF, AS WITH WRITTEN DOCUMENTATION.
SECOND WOULD BE STATEMENTS MADE BY INDIVIDUALS, BUT NORTON AIR FORCE BASE DID WORK AND USED CHEMICALS IN VOLUMES THAT ARE ORDERS OF MAGNITUDE LARGER THAN OTHER NORMAL BUSINESSES IN SAN BERNARDINO. WE PULLED SOME NAPHTHA TANKS OUT OF NORTON, THREE 30,000-GALLON NAPHTHA TANKS. AND TYPICALLY YOUR LARGER GASOLINE TANK IS 10,000 GALLONS. THEY JUST DID A LOT OF BUSINESS AT NORTON. A LOT OF THE DUTY OF THE DEFENSE DEPARTMENT WAS DONE THERE, AND IT'S JUST MUCH LARGER VOLUMES AT NORTON. IT'S ALSO QUITE A WAYS DOWN GRADIENT FROM THE SITE THAT WE WERE STUDYING.

Q DO YOU HAVE ANY INFORMATION ABOUT WHETHER THERE WAS ANY OFF-SITE DISPOSAL OF WASTE OR SOLID MATERIAL FROM NORTON?
A OFF-SITE DISPOSAL MEANING DID THEY LEGALLY SEND STUFF TO HAZARDOUS WASTE DISPOSAL SITES? DID THEY DUMP IT ILLEGALLY OFF THEIR SITE?
Q NO, THAT'S NOT MY QUESTION. MY QUESTION IS -- WELL, LET ME ASK YOU A SIMPLE QUESTION.
DO YOU HAVE ANY INFORMATION AS TO WHETHER OR NOT NORTON EVER UTILIZED CAJON LANDFILL?
A FOR SOLID WASTE MANAGEMENT?
Q YES.
A I DON'T HAVE ANY INFORMATION THAT THEY DID, BUT CAJON SERVED THE SAN BERNARDINO AREA.
Q SO IT WOULD BE LIKELY BASED ON --
A IT COULD BE LIKELY THAT NORTON SENT SOLID WASTE THERE. THEY DID HAVE THEIR OWN SOLID WASTE SITES ON THE BASE, AS MOST BASES DID IN THE '60S AND EARLY '70S.
Q WHAT ABOUT BEFORE THE '60S AND '70S?
A I -- I WOULDN'T KNOW. BUT IT'S NOT UNCOMMON TO FIND LOTS OF DISPOSAL SITES ON MILITARY INSTALLATIONS. AND ONE OF THE REASONS I'M NOT REAL CLEAR ON THAT IS BECAUSE NORTON WAS SUBJECT TO EXTENSIVE CERCLA, C-E-R-C-L-A, CLEANUPS. AND IN THAT

PROCESS FROM 1983 TO 1995 TO CURRENT, THE LEAD AGENCIES WERE THE SANTA ANA REGIONAL WATER CONTROL BOARD, THE FEDERAL EPA, AND THE STATE DEPARTMENT OF TOXIC SUBSTANCES CONTROL. AND THOSE THREE AGENCIES WERE MORE AND MORE INVOLVED IN THE CLEANUP OF NORTON, WHICH, AS I SAID, HAS TAKEN OVER A DECADE.
SINCE 1983, THE COUNTY MANAGED SOME ROUTINE WASTE GENERATION ON AN ONGOING BASIS THERE. REGULATED THAT ACTIVITY. BUT MOST OF THE CLEANUP UNDER CERCLA WAS DIRECTED BY THE SANTA ANA BOARD, THE DEPARTMENT OF TOXIC SUBSTANCES CONTROL, AND THE FEDERAL EPA. SO I KIND OF BACKED OUT OF THAT PROCESS. BUT THERE ARE VOLUMES OF RECORDS ON NORTON, EVERYTHING THAT HAPPENED THERE.
Q IN RESPONSE TO MR. CARSON EARLIER WHEN HE WAS ASKING YOU ABOUT DRUMMED VOLUMES OF PETROLEUM DISTILLATES IN THE 1960'S AND WHO MIGHT HAVE GENERATED IT, YOUR RESPONSE WAS OUTSIDE OF THE FEDERAL GOVERNMENT. CAN YOU BE A LITTLE MORE SPECIFIC? CAN YOU ELABORATE ON THAT RESPONSE?
A FOR THE AREA, I DON'T -- I CAN'T THINK OF ANY BUSINESS THAT WOULD END UP GENERATING DRUMS OF SOLVENT OTHER THAN SOMEBODY THAT WOULD BE COLLECTING THOSE TYPES OF SOLVENTS FROM OTHER SMALLER BUSINESSES.

Q WHAT ABOUT THE FEDERAL GOVERNMENT?
A WELL, AS I SAID, NORTON AIR FORCE BASE. THE DEFENSE DEPARTMENT DID A HUGE AMOUNT. THAT WAS A CENTRAL LOCATION FOR THE MILITARY AIR LIFT COMMAND FOR MAINTENANCE AND REPAIR AND TESTING OF THE ENGINES. AND SO THEY DID A LOT OF MAINTENANCE, TESTING, REPAIR OF AIRPLANES AND ENGINES THERE.
SO, LIKE I SAID, THERE'S ORDERS OF MAGNITUDE AND VOLUMES GREATER GENERATED FROM NORTON THAN FROM OTHER BUSINESSES THAT WE COULD FIND IN SAN BERNARDINO OF THAT TYPE OF WASTE.
Q ANY OTHER FEDERAL INSTALLATIONS THAT YOU CAN THINK OF IN THE AREA THAT WOULD HAVE GENERATED PETROLEUM DISTILLATES?
A WELL, THERE ARE --
MR. MCDERMOTT: I'LL OBJECT TO THE QUESTION. HE DIDN'T TESTIFY THAT THEY WOULD GENERATE PETROLEUM DISTILLATES. HE TESTIFIED THAT HE THOUGHT THAT IT WAS POSSIBLE. I THINK THAT YOUR QUESTION MISSTATES HIS TESTIMONY.
MS. BOSCO: I DIDN'T MISSTATE HIS TESTIMONY.
Q MY QUESTION IS ARE THERE ANY OTHER FEDERAL INSTALLATIONS YOU ARE AWARE OF IN THE AREA THAT WOULD HAVE GENERATED PETROLEUM DISTILLATES?
MR. MCDERMOTT: WHEN YOU SAY "ANY OTHER

FEDERAL FACILITIES," YOU'RE IMPLYING THAT THERE WAS ONE TO BEGIN WITH.
MS. BOSCO: I THINK HE HAS TESTIFIED THAT NORTON WOULD HAVE GENERATED PETROLEUM DISTILLATES.
MR. MCDERMOTT: I DON'T THINK SO. I THINK MR. CARSON ASKED THAT QUESTION AND HE SAID HE WOULD ASSUME THAT THEY DID. BUT HE DIDN'T KNOW. IF YOU WANT TO GO BACK, WE WILL FIND THE TESTIMONY ON THE RECORD.
MS. BOSCO: WHY DON'T I ASK HIM THE QUESTION.
Q WOULD NORTON HAVE GENERATED PETROLEUM DISTILLATES?
A DO I HAVE SPECIFIC KNOWLEDGE THAT THEY DID AND THE SPECIFIC TYPE AND QUANTITY?
NO, I DON'T HAVE THAT KNOWLEDGE WITH ME.
IS IT LIKELY THEY CAN POSSIBLY PRODUCE THAT?
IT IS LIKELY, YES, INDEED THAT THEY PRODUCED LARGE VOLUMES OF THOSE TYPES OF SUBSTANCES. THAT WAS THEIR BUSINESS: CLEANING, MAINTAINING, AND REPAIRING AIRPLANES AND AIRPLANE ENGINES. I DIDN'T HAVE THE SPECIFIC, QUOTE, UNQUOTE, KNOWLEDGE. BUT FROM MY EXPERIENCE AND KNOWLEDGE OF WHAT THEY DID, THEY ARE CERTAINLY LIKELY TO HAVE PRODUCED THAT.

Q BASED ON THAT SAME EXPERIENCE, ARE THERE ANY OTHER FEDERAL FACILITIES IN THE AREA THAT WERE LIKELY TO HAVE GENERATED PETROLEUM DISTILLATES?
A WE HAVE GEORGE AIR FORCE BASE THAT USED TO EXIST IN THE VICTORVILLE AREA. AND MARCH AIR FORCE BASE THAT EXISTED IN WHAT IS NOW MORENO VALLEY.
Q ANYTHING ELSE?
A KAISER STEEL. THAT'S NOT A FEDERAL BUILDING.
Q VERY EARLY ON IN THE DAY, YOU TALKED ABOUT THAT THE COUNTY HAS REGULATORY AUTHORITY OVER THE CITY, STATE, AND FEDERAL FACILITIES WITHIN ITS JURISDICTIONS.
WHAT ARE THE FEDERAL FACILITIES WITHIN THE COUNTY'S JURISDICTION THAT YOU HAVE AUTHORITY FOR INSPECTION?
A CURRENTLY, THERE ARE SEVERAL. THERE'S FORT IRWIN. NORTH OF FORT IRWIN, THERE'S A TRACKING STATION, SATELLITE DEEP SPACE TRACKING STATIONS. TWENTY-NINE PALMS MARINE CORPS BASE. U.S. FOREST SERVICE. AND THEN PREVIOUSLY GEORGE AND NORTON AIR FORCE BASE. FEDERAL PRISON AT BORON. I THINK THAT'S PRETTY MUCH IT.
Q IS THERE A POSTAL SERVICE FACILITY?
A REDLANDS HAS A UNITED STATES POSTAL

OPERATION, BUT I DON'T KNOW IF THEY LEASE OUT THE SERVICE ON THEIR VEHICLES OR NOT. THEY MAY LEASE OR HAVE THE SERVICE PROVIDED. LOTS OF COUNTY, CITY, AND STATE AGENCIES ARE OUTSOURCING THEIR VEHICLE MAINTENANCE, AND I DON'T KNOW SPECIFICALLY IF THEY DO THAT THERE. BUT WE COULD ALWAYS CHECK THE RECORDS AND FIND OUT.
Q WHAT ABOUT THE FEDERAL PRISON? WHAT WOULD BE IN THERE?
A THEY HAVE SOME MINOR AMOUNTS OF MAINTENANCE AND CLEANING THAT THEY DO. AND THEY ALSO HAVE SOME -- I BELIEVE A HOBBY SHOP AND AN OLYMPIC SWIMMING POOL THERE WHICH GENERATES -- CONTAINS CHLORINE AND OTHER THINGS THERE OF MINIMAL AMOUNT, BUT REGULATABLE.
Q OF THE FACILITIES THAT YOU HAVE JUST LISTED, DO YOU KNOW WHETHER ANY OF THEM USE CAJON LANDFILL FOR SOLID WASTE DISPOSAL?
A NO, I DON'T KNOW. THERE WOULD BE WAYS OF FINDING OUT.
MS. BOSCO: I HAVE NO FURTHER QUESTIONS. THANK YOU.
MR. CARSON: DO YOU HAVE ANY?
MS. RUSHTON: JUST A COUPLE.
///

EXAMINATION

BY MS. RUSHTON:
Q WERE YOU INVOLVED WITH ANY ADDITIONAL SOURCE INVESTIGATION FOLLOWING THE PREPARATION OF THIS REPORT; SOURCE INVESTIGATION OF THE CONTAMINANTS?
A NOT THAT I CAN RECALL RELATED TO THE REPORT, BUT OBVIOUSLY WE WOULD GO OUT AND DO OTHER TYPES OF INSPECTIONS, ROUTINE HAZARDOUS WASTE, HAZARDOUS MATERIALS COMPLIANCE INSPECTIONS. I DON'T RECALL ANYTHING THAT WAS THEN RELOCATED BACK TO THE REPORT.
THERE MAY HAVE BEEN SOME REFERRALS TO THE REGIONAL WATER QUALITY CONTROL BOARD BY STAFF BECAUSE THERE WAS A PRETTY HEIGHTENED AWARENESS ABOUT LOOKING FOR THESE TYPES OF THINGS. AND SOMEBODY MIGHT HAVE SEEN SOMETHING AND SENT IT TO THE REGIONAL BOARD.
Q IN THE COURSE OF YOUR DUTIES, DID YOU REVIEW INFORMATION THAT WAS BEING DEVELOPED BY THE REGIONAL BOARD OR BY EPA?
A ON THIS THERE WAS SOME KIND OF COORDINATION MEETINGS BETWEEN THE AGENCIES WHERE WE WOULD DELIVER THIS TO THE REGIONAL BOARD AND HAVE SEVERAL PEOPLE AROUND THE CONFERENCE TABLE AND TALK ABOUT IT, TALK ABOUT WHAT THEY WERE DOING. AND WE ALL

ENDED UP GOING TO THE DEDICATION OF THE FACILITY THAT CLEANED UP THE GROUNDWATER AND THOSE TYPES OF THINGS.
SO THERE WAS DISCUSSIONS BETWEEN THE AGENCIES ABOUT WHAT WAS GOING ON AND PEOPLE CALLING EACH OTHER TO SEE WHAT WAS HAPPENING.
Q ARE YOU INVOLVED IN ANY OF THE CURRENT MEETINGS WITH RESPECT TO THE INVESTIGATION OF THE SOURCE OPERABLE UNIT?
A THE SOURCE OPERABLE UNIT? I DON'T KNOW WHAT THAT IS.
Q I THINK THAT ANSWERS THE QUESTION. THANK YOU. I THINK THAT'S ALL.
MR. CARSON: I JUST HAVE A COUPLE.

FURTHER EXAMINATION

BY MR. CARSON:
Q YOU MENTIONED KAISER STEEL. WHERE ARE THEY LOCATED?
A CHERRY AVENUE IN FONTANA. I WAS TRYING TO RECOLLECT FACILITIES THAT COULD HAVE DEVELOPED MULTIPLE DRUMS OF SOLVENT.
Q KAISER STEEL WOULD BE ONE?
A I'M TRYING TO RUN THROUGH MY MIND AS I'M TESTIFYING HERE AS TO WHO WOULD HAVE PRODUCED A

LARGE NUMBER OF DRUMS FILLED WITH SOLVENT.
Q AND KAISER STEEL --
A OBVIOUSLY. IT'S A VERY LARGE OPERATION.
Q DO YOU KNOW WHEN THEY BEGAN OPERATIONS?
A ABOUT 1943. '42 OR '43. BUT AS YOU ARE ASKING QUESTIONS, I'M THINKING THROUGH THESE THINGS. AND KAISER GOT INTO MOST OF ITS TROUBLE BECAUSE IT DISPOSED MOST OF ITS WASTE ON-SITE AND WAS SUBJECT TO THAT CLEANUP AND ABATEMENT BY THE REGIONAL BOARD AND A SUPERFUND CLEANUP. AND MOST OF THAT TROUBLE WAS BECAUSE OF THINGS ON-SITE, AS MOST MILITARY INSTALLATIONS.
Q YOU MENTIONED THAT THERE WERE WAYS OF FINDING OUT IF FACILITIES USED CAJON. WHAT WAYS WOULD YOU USE TO FIND THAT INFORMATION?
A IF THE BUSINESS IS STILL AROUND, ASKING FOR THE RECORD. THEY PAY A DISPOSAL BILL, AND THEY PAY -- IF THE CITY PICKS UP THEIR WASTE, THEY WILL HAVE MADE PAYMENTS TO THE CITY TO HAUL THEIR WASTE AWAY. AND THE CITY WILL TYPICALLY HAVE A LANDFILL THAT IT USES FOR A CERTAIN AREA. IT'S AN ECONOMIC DECISION BY THE CITY WHICH LANDFILL THEY USE. AND THE OPPORTUNITY TO LOOK FOR THE RECORDS OF PAYING BILLS TO

A TRASH HAULER, GOING TO THE TRASH HAULER AND SAYING "WHICH FACILITY DID YOU USE?"
Q WOULD YOU HAPPEN TO KNOW WHERE THE CITY WOULD KEEP ITS RECORDS WITH RESPECT TO THOSE TYPES OF THINGS?
A AGAIN, IT'S A MATTER OF WHEN YOU POINT OUT THINGS TO ME THAT I HAVEN'T SEEN IN TEN YEARS. WHERE WAS IT? 182 SOUTH SIERRA WAY. THE SAN BERNARDINO CITY GARAGE IS ALSO WHERE THEY REPAIR AND FIX THEIR SOLID WASTE VEHICLES. THE CITY HALL IS AT 300 NORTH "D" STREET.
Q I'M SORRY.
A CITY HALL IS WHERE THE ADMINISTRATIVE ACTIVITIES OF THE WATER BILLS AND THE SEWER BILLS ARE ADMINISTRATIVELY MANAGED, 300 NORTH "D" STREET. BUT THE REPAIR YARD, AS YOU POINTED OUT TO ME, IS AT 182 SOUTH SIERRA WAY.
Q IN THE COURSE OF YOUR JOB, WHAT KINDS OF DOCUMENTS DO YOU UNDERSTAND ARE KEPT AT CITY HALL, I GUESS, THAT WOULD RELATE TO THAT ISSUE?
MS. BOSCO: OBJECTION; FOUNDATION.
GO AHEAD.
MR. JOCKS: YOU CAN ANSWER.
THE WITNESS: THAT'S WHERE MOST PEOPLE PAY THEIR BILLS. CITY HALL IS WHERE YOU PAY YOUR BILL.

THAT'S WHERE THEY KEEP THE FINANCIAL RECORDS. MANY TIMES OPERATIONAL RECORDS ARE KEPT AT A MAINTENANCE YARD.
BY MR. CARSON:
Q HOW ABOUT FOR COUNTY RECORDS?
A IN TERMS OF --
Q ANY COUNTY RECORDS THAT MIGHT BE RELEVANT TO THE CAJON LANDFILL AND WASTE THAT WAS RECEIVED THERE.
A ONCE AGAIN, THE FUNCTIONAL OFFICE, THE DEPARTMENT OFFICE TYPICALLY KEEPS THE RECORDS OF ASSIGNMENT OF PEOPLE. THIS OFFICE WOULD BE KEEPING WHO WAS ASSIGNED WHERE. THEY MAY NOT -- HOW LONG THEY KEEP THOSE, I'M NOT REAL SURE.
AND AT THE COUNTY LEVEL, THE DEPARTMENT KEEPS THE FISCAL RECORDS. THE AUDITOR MAY HAVE MORE GENERAL ACCOUNTING RECORDS. BUT TYPICALLY FISCAL RECORDS ALL RESIDE WITH MY DEPARTMENT FISCAL MANAGER. WE HAVE FILES ON EVERYTHING THAT I BUY, SELL, AND GET MONEY FOR.
Q BUT DO YOU KNOW IF THEY WOULD HAVE HISTORICAL RECORDS FROM THE '60S AND '70S?
A THE ASSIGNMENTS OF INDIVIDUALS ARE USUALLY -- RECORDS ARE USUALLY KEPT BY THAT INDIVIDUAL. DEPARTMENTS USUALLY DON'T KEEP A LONG

TRACK OF WHO GETS ASSIGNED WHERE ON WHAT DATE. USUALLY IF YOU WANT THAT INFORMATION, YOU HAVE TO GO BACK TO THE EMPLOYER.
'60 AND '70, THAT WOULD BE A REACH. AS YOU CAN SEE, I HAVE DIFFICULTY FINDING THIS TEN YEARS AGO. SO I'M SURE THERE'S A CARBON COPY SOMEWHERE.
Q YOU HAVE NO SPECIFIC INFORMATION THAT NORTON AIR FORCE BASE ACTUALLY SENT WASTE TO THE CAJON LANDFILL; IS THAT CORRECT?
A OKAY. THAT KIND OF DEPENDS ON WHAT DEFINITION. DO YOU WANT SPECIFIC INFORMATION? DO YOU MEAN DO I HAVE A PAPER RECORD?
Q ANY SPECIFIC INFORMATION THAT NORTON ACTUALLY SENT WASTE TO CAJON.
A I DON'T HAVE -- ON SOLID WASTE OR --
Q ANY KIND OF WASTE.
A I WOULD HAVE TO SEARCH THROUGH OUR FILE ON NORTON TO KNOW IF I HAVE SPECIFIC DOCUMENTATION ON THAT.
Q AS YOU TESTIFY HERE TODAY, THOUGH, YOU ARE AWARE OF NO SPECIFIC INFORMATION THAT CLEARLY SHOWS THAT NORTON AIR FORCE BASE SENT ANY WASTE TO THE CAJON LANDFILL; IS THAT CORRECT?
A DO I HAVE SPECIFIC INFORMATION THAT

1 THEY SENT MATERIAL THERE? I WOULD HAVE TO SAY NO. I
2 DON'T HAVE SPECIFIC INFORMATION TODAY THAT THEY DID
3 SEND WASTE TO CAJON. I DO NOT HAVE SPECIFIC
4 INFORMATION.
5 MR. CARSON: THANK YOU. THAT'S ALL WE HAVE.
6 MS. BOSCO: I HAVE ONE.
7
8 FURTHER EXAMINATION
9
10 BY MS. BOSCO:
11 Q EARLIER YOU SAID THAT IT WAS VERY
12 EASILY LIKELY THAT CAJON LANDFILL WAS USED BY NORTON
13 AIR FORCE BASE FOR SOLID WASTE.
14 ON WHAT WERE YOU BASING THAT
15 STATEMENT?
16 A THAT IT'S IN THE SPHERE OF SAN
17 BERNARDINO. THE CAJON LANDFILL IS WHAT WAS USED.
18 OTHERWISE IT WOULD HAVE TO GO TO THE SAN TIM
19 LANDFILL. IT CAN'T GO TO REDLANDS LANDFILL BECAUSE
20 REDLANDS LANDFILL IS FOR CITY ONLY. AND SAN TIM IS A
21 MORE RECENT LANDFILL.
22 OTHER OPTIONS ARE WHAT USED TO BE THE
23 FONTANA LANDFILL, WHICH IS MID VALLEY. SO THE
24 DISTANCES WOULD BE GREATER. OR THE COLTON LANDFILL.
25 SO WHEN YOU SPACIALLY RELATE THOSE

1 SITES AND WHO WAS SERVING THE AREA, IT WOULD GENERALLY
2 POINT TOWARDS CAJON.
3 Q THANK YOU.
4 A THAT'S JUST AN EXPERIENCE. EDUCATED
5 ESTIMATION.
6 MR. MCDERMOTT: AS FAR AS YOU KNOW --
7 MS. BOSCO: EXCUSE ME. I THOUGHT ONE COUNSEL --
8 MR. MCDERMOTT: EXCUSE ME. IT'S NOT YOUR
9 WITNESS, AND YOU HAVE NO BASIS TO OBJECT TO IT. BUT I
10 CAN FEED HIM THE QUESTION IF THAT WILL MAKE YOU FEEL
11 BETTER.
12 MS. BOSCO: YES, IT WOULD.
13 MR. CARSON: WE DON'T HAVE ANYTHING FURTHER.
14 THANK YOU VERY MUCH.
15 THE WITNESS: AND, AGAIN, I'M RESPONDING TO
16 INFORMATION I HAVE NOT SEEN IN MANY YEARS AND WOULD BE
17 MORE THAN HAPPY TO RESEARCH, PROVIDE DOCUMENTS ON ANY
18 QUESTIONS THAT YOU WOULD LIKE TO SEE ANSWERED.
19 MR. CARSON: WE'LL TALK TO MR. JOCKS ABOUT
20 THAT.
21 THE WITNESS: DO I GET TO KEEP ANY OF THOSE?
22 MR. CARSON: NO, THEY HAVE TO STAY WITH THE
23 COURT REPORTER.
24 THE WITNESS: AND, ALSO, DO I GET A COPY OF
25 THE TESTIMONY?

1 MR. CARSON: YES, A COPY OF THE TRANSCRIPT
2 WILL BE PROVIDED TO YOU, AND YOU WILL HAVE THE
3 OPPORTUNITY TO REVIEW IT.
4 THE WITNESS: AND THEN COMMENT BACK ON IT OR
5 DO YOU WANT IT TO EVEN GO TO THAT STEP?
6 MR. CARSON: YOU SHOULD VISIT WITH MR. JOCKS
7 ABOUT THAT.
8 MR. JOCKS: I ASSUME WE'LL DO THIS THE
9 STANDARD WAY. WHAT ARE YOU GOING TO WANT DONE WITH
10 THE ORIGINAL? DO YOU WANT TO PUT THAT ON THE RECORD?
11 MR. CARSON: THE ORIGINAL COMES BACK TO US.
12 MR. JOCKS: SO WE'LL HAVE 30 DAYS FOR HIM TO
13 REVIEW IT, MAKE CHANGES, GET IT TO HIM FOR HIM TO
14 SIGN.
15 MR. MCDERMOTT: I THINK 30 DAYS IS ALL RIGHT.
16 WE CAN FOLLOW UP WITH THAT WITH YOU.
17 MR. JOCKS: OKAY.
18 MR. MCDERMOTT: IN TERMS OF THE DOCUMENTS THAT
19 MIGHT BE, I THINK YOU SAID, IN A U-HAUL, IS THAT
20 POSSIBLY A U-HAUL STORAGE FACILITY? IS THERE ANYTHING
21 WE CAN DO TO HAVE FOLLOW-UP IN TERMS OF SEEING WHAT'S
22 THERE?
23 MR. JOCKS: YES. ABSOLUTELY. I INTEND TO
24 HAVE PETER AND HIS PEOPLE LOOK AND VERIFY WHAT'S
25 THERE. AND IF THERE'S SOMETHING, WE CAN GET IT TO

1 EVERYBODY. AND IF THERE ISN'T, WE WILL TELL YOU WE
2 STRUCK OUT.
3 MR. MCDERMOTT: IS THAT SOMETHING YOU CAN DO --
4 CAN YOU PUT IT AT THE FRONT OF YOUR BUSY SCHEDULE? IS
5 THERE ANY WAY YOU CAN DO IT ON AN EXPEDITED BASIS?
6 THE WITNESS: SURE. I CAN PUT IT ON THE
7 EXPEDITE LIST. I WISH YOU GUYS WERE THERE TO HELP ME
8 DESIGN THE STUDY BECAUSE YOU HAVE SOME VERY GOOD
9 QUESTIONS.
10 MR. CARSON: WE'RE OFF THE RECORD.
11 * * * * * *
12 (WHEREUPON, THE PROCEEDINGS
13 CONCLUDED AT 12:26 P.M.)
14 * * * * * *
15 I DECLARE UNDER PENALTY OF PERJURY
16 THAT THE FOREGOING IS TRUE AND
17 CORRECT.
18 EXECUTED THIS _____ DAY OF
19 _____, 19 _____.
20
21 _____
22 PETER BRIERTY
23
24
25