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UTAH SURFACE WASTEWATER IMPOUNDMENT

ASSESSMENT REPORT

Ъу

Mary L. Cleave V. Dean Adams Donald B. Porcella

UTAH WATER RESEARCH LABORATORY
Utah State University
Logan, Utah 84322

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CHAPTER 1

EXECUTIVE SUMMARY

The Surface Impoundment Assessment process presented an organized consistent system for evaluating potential threats to groundwater resources from surface impoundments of wastes. This assessment established a data base which locates waste surface impoundments in Utah and assesses the majority of these impoundments with this prescribed system (Appendix F). This data base may be used to identify surface impoundments in Utah which may create problems with regard to groundwater contamination.

DATA SUMMARY

A summary of the sites and impoundments located and assessed during this study is provided as follows:

SUMMARY OF THE SITES AND IMPOUNDMENTS LOCATED AND ASSESSED^a

C	N	umber of S	ites	Number of Impoundments			
Category	Located	Assessed	% Assessed	Located	Assessed	% Assessed	
Municipal	 55	44	80	217	190	88	
Industrial	38	31	82	100	86	86	
Agricultural	6	6	100	8	8	100	
Mining	3	1	33	7	4	57	
Oil & Gas	37	37	100	423	423	100	

^aThis appears as Table 2 in Chapter 4.

The potential hazard of the surface impoundments assessed to groundwater is based on two values established during the assessment procedure. These values are identified as the pollution potential and the health hazard of the surface impoundment.

The pollution potential rating is based on the first four steps of the assessment procedure. Out of the 711 impoundments assessed during this study 154 impoundments, or 22 percent of these impoundments, exhibited a pollution potential value high enough to be of concern (greater than 19 assessment units).

The health hazard rating is based on the proximity of an impoundment to a water well and the anticipated direction of movement of the waste plume. Out of the 154 impoundments exhibiting high pollution potentials, 35 impoundments, or 23 percent of these impoundments, also exhibited a health hazard rating which may be cause for concern (Case A).

These 35 impoundments exhibiting a combination of a high pollution potential and health hazard values are located on 13 sites. They represent sites from every category studied. These sites may pose a threat to groundwater supplies as identified by the assessment process. The assessment data are discussed in more detail in Chapter 4.

There have been instances of groundwater contamination in Utah. One of these instances has been documented through legal action. These instances are discussed in Chapter 6.

STATE PROGRAM FOR PROTECTING GROUNDWATER

The Utah State Board of Health is a body politic recommended by the Governor and approved by the Utah Senate that serves as the regulatory authority for the State Department of Health (Holt, 1979). Regulatory and enforcement authority is vested in the State Board of Health by Section 26-15-5 of the Utah Code Annotated, 1953, as amended. Additional regulatory committees have been authorized by state law to promulgate rules for the control of specific health

or environmental programs as have been deemed necessary with increasing demands on the state's natural resources and environmental protection programs.

The state water pollution control organization consists of the Division of Environmental Health within the State Health Department (Pitkin, 1979). The Division of Environmental Health includes Bureaus of Water Pollution Control, Public Water Supply, and Solid Waste Management, each working under separate state legislative authority and under separate federal acts: The Federal Clean Water Act, the Safe Drinking Water Act, and the Resource Conservation and Recovery Act. The organization of the state environment health programs is currently under review by a state appointed reorganization committee. Therefore, this organization may change within the near future (Dalley, 1980).

Under present State Health Department policy, the Bureau of Water Pollution Control has been designated as the lead agency for conducting the permitting and operational requirements for pits, ponds and lagoons and for the construction of facilities for the containment of sludges from water and sewage treatment plants (Holt, 1979). It should be understood, however, that a dual regulatory responsibility exists between the Bureaus of Water Pollution Control and Solid Waste Management for control and disposal of sewage and wastewater sludges. The Bureau of Solid Waste Management presently assumes a significant role in establishing policy for the management of sewage and water treatment sludge.

CONCLUSIONS AND RECOMMENDATIONS

At the present time, no specific groundwater program exists in the State Division of Health. Therefore, responsibility for the protection of ground-water is also shared by the state agencies mentioned above. A staff would be

necessary to achieve protection of drinking water supplies by addressing specific needs within this state.

One area requiring attention is enforcement of existing laws. In order to adequately enforce these laws there is a need for increased public education and manpower within the state (Georgeson, 1979a; Gray, 1979; Pitkin, 1979a; Thompson, 1979). The enforcement interpretation of these laws must allow enough flexibility to prevent illegal actions. For example, the closure of a small dump may promote illegal dumping (Gray, 1979).

Enforcement capabilities require an adequate data base, monitoring program, and staff expertise. Inadequacies exist in baseline groundwater quality data (Pitkin, 1979a) and hydrogeology data (Georgeson, 1979a) especially in remote areas of the state. Also, more quality data are needed on the wastes being treated (Maxwell, 1979). Increased monitoring is necessary to create an adequate data base and to identify problems before public complaints call attention to them.

CHAPTER 2

RECOMMENDATIONS AND CONCLUSIONS

The Surface Impoundment Assessment process presented an organized consistent system for evaluating potential threats to groundwater resources from surface impoundments of wastes. This assessment established a data base which locates waste surface impoundments in Utah and assesses the majority of these impoundments with this prescribed system (Appendix F). This data base may be used to identify surface impoundments in Utah which may create problems with regard to groundwater contamination. In order to maintain consistency within this data base, one person completed all of these assessments.

This assessment process encountered certain limitations which may have influenced this data base. Utah contains many remote areas where adequate data essential to the assessment process was not readily available. In particular, information on present groundwater quality and hydrogeology were liable to many assumptions. This dearth of information, although more obvious in remote areas, was not limited only to these areas. Another problem encountered during this process was a lack of response by individuals or groups to inquiries for information on their surface impoundments.

CONCLUSIONS BASED ON THE DATA

The potential hazard of the surface impoundments assessed to groundwater is based on two values established during the assessment procedure. These values are identified as the pollution potential and the health hazard of the surface impoundment.

The pollution potential rating is based on the first four steps of the assessment procedure. Out of the 711 impoundments assessed during this study

154 impoundments, or 22 percent of these impoundments, exhibited a pollution potential value high enough to be of concern (greater than 19 assessment units).

The health hazard rating is based on the proximity of an impoundment to a water well and the anticipated direction of movement of the waste plume. Out of the 154 impoundments exhibiting high pollution potentials, 35 impoundments, or 23 percent of these impoundments, also exhibited a health hazard rating which may be cause for concern (Case A) (Appendix A).

These 35 impoundments exhibiting a combination of a high pollution potential and health hazard values are located on 13 sites. They represent sites from every category studied. These sites may pose a threat to groundwater supplies as identified by the assessment process.

There have been instances of groundwater contamination in Utah. One of these instances has been documented through legal action. It involved off-site pit disposal of oily brine wastes associated with the oil and gas industry by a common carrier company in Uintah County. This disposal practice may have created other cases of this nature and may identify a problem occurring in this area of the state.

EFFECTIVENESS OF PROGRAMS

Problems like this due to waste disposal by a small independent common carrier are extremely hard to control. Monitoring and enforcement of existing federal and state regulations which could control this practice are presently limited until more funds are available (McNeal and Roberts, 1979).

There has been a decrease in potential pollution problems from municipal systems (Pitkin, 1979a). Approximately 80 percent of the municipal systems are now on central collection systems. Therefore septic tanks and drainfields

are not in concentrated areas. Most of the growth in the state is occurring in urban areas where central collection is already established.

RECOMMENDATIONS

At the present time, no specific groundwater program exists in the State Division of Health. A staff would be necessary to achieve protection of drinking water supplies by addressing specific needs within this state.

One area requiring attention is enforcement of existing laws. In order to adequately enforce these laws there is a need for increased public education and manpower within the state (Georgeson, 1979a; Gray, 1979; Pitkin, 1979a; Thompson, 1979). The enforcement interpretation of these laws must allow enough flexibility to prevent illegal actions. For example, the closure of a small dump may promote illegal dumping (Gray, 1979).

Enforcement capabilities require an adequate data base, monitoring program, and staff expertise. Inadequacies exist in baseline groundwater quality data (Pitkin, 1979a) and hydrogeology data (Georgeson, 1979a) especially in remote areas of the state. Also, more quality data are needed on the wastes being treated (Maxwell, 1979). Increased monitoring is necessary to create an adequate data base and to identify problems before public complaints call attention to them. For example there are small nondischarging storage basins associated with some industrial development (like brine pits) which may create problems (Pitkin, 1979a). Problems may also arise from improperly constructed or sealed wells (Georgeson, 1979a).

Groundwater assessments conducted for Utah 208 planning studies are based on the information available at the time. These studies dealt mainly with groundwater as a low priority area. However, Salt Lake County will undertake

collection of additional groundwater information as a part of the 208 planning process (Tate, 1979).

In 1976 Congress passed the Resources Conservation and Recovery Act (RCRA). This Act regulates both hazardous and non-hazardous waste disposal. The Utah legislature passed the Utah Hazardous Waste Act in 1979 to regulate hazardous waste disposal and regulations to implement this act are presently being written. Non-hazardous waste disposal is presently regulated under the Utah Code of Solid Waste Disposal Regulations. The Bureau of Solid Waste Management expects to have the hazardous waste program operational by the end of 1980 and is presently conducting a federally mandated open dump inventory with the goal of upgrading open dump to the status of sanitary landfills. This inventory will be partially completed during 1980 (Gray, 1979).

A better data base regarding groundwater in the state would be of benefit to both the 208 planning process and implementation of RCRA subtitles C and D.

CHAPTER 3

METHODOLOGY

ORGANIZATION OF SIA PROJECT TEAM

A State Technical Committee (STC) was organized to oversee the progress of the Surface Impoundment Assessment (SIA) program. This committee was composed of Dick Hansen, Deputy Director of Health; Gale Smith, Drinking Water; Don Ostler, Water Pollution; and Dale Parker, RCRA Solid Waste. This committee would observe the progress of the project to ensure that it met the initial goals and produced the information that the U.S. EPA desired.

CONTRACTUAL ARRANGEMENTS

At the request of the STC on May 25, 1978, Donald B. Porcella, V. Dean Adams, and Edward P. Fisk met to discuss the SIA and the possibility of the Utah Water Research Laboratory performing the assessment. Utah State University was awarded a grant to perform the SIA which was completed at UWRL.

From August 22 to August 24, Donald B. Porcella and V. Dean Adams attended a SIA training session in Atlanta, Georgia. The purpose of this training session was to familiarize the SIA participants with the program, its background, and its ultimate goals.

KESPONSIBILITIES AND TECHNICAL BACKGROUNDS OF PARTICIPANTS

Donald B. Porcella was the principal investigator of the SIA until his resignation as the Associate Director of the Utah Water Research Laboratory (UWRL) in June 1979. He received a PhD in Environmental Health Science from the University of California, Berkeley, in 1967. He was a Fulbright Postdoctoral Fellow at NIVA, Oslo, Norway, from 1967-1968. He had been at

Utah State University since 1970 as an Associate Professor and Associate Director of the UWRL.

V. Dean Adams is a Research Associate Professor at Utah State University and became the principal investigator with D. B. Porcella's resignation.

Dr. Adams received his PhD from USU in Organic Chemistry in 1972. He has been in the Division of Environmental Engineering since 1975. During this time he has been the head of the Water Quality Analysis Laboratory at UWRL.

Darwin L. Sorensen is a Research Microbiologist at UWRL. He received a MS from USU in Bacteriology-Water Quality in 1975. His responsibilities on this project included initial organization of the study and supervision of the data collection. In December 1978 he took a leave of absence from UWRL to pursue a PhD program at Colorado State University.

Eugene K. Israelsen has been a Research Engineer at UWRL since 1965. He received a MS in Engineering at USU in 1967. He developed the initial FORTRAN computer program to list the surface impoundment assessments.

Mary L. Cleave is a Research Engineer at UWRL and received her PhD in Engineering at Utah State University in 1979. She debugged the FORTRAN computer program to list the surface impoundment assessments, and coordinated the writing of the final report.

Garry L. Laughlin is a Research Technician at UWRL. He received his AA in Marine Biology. He gathered the data and performed the assessments.

Resumes further detailing the technical backgrounds of the professional staff involved in this study are contained in Appendix D.

METHODS OF DATA COLLECTION

Darwin L. Sorensen and Garry Laughlin met with the Utah Bureau of Water Pollution Control, Utah Water Rights Division, and Division of Oil, Gas, and

Mining to obtain permission to use their filing systems to obtain information for the SIA. Information on facilities for national parks and forests was obtained through the National Park Service and the National Forest Service, respectively. For state parks, the State Department of Parks and Recreation was contacted for information. For information on impoundments on Indian lands, the Phoenix and Navajo Area Indian Health Service region offices were contacted.

Municipal Systems

The Water Pollution Office provided a list of municipal systems in the state as of the end of 1977. This list was updated with the aid of the Water Pollution staff (Appendix E). The Water Pollution filing system contained:

Municipal NPDES permits, municipal construction grants, and microfilm of construction specifications. Additional data were collected by a mail survey conducted during spring 1979 followed by a telephone survey conducted during fall 1979.

Industrial Systems

The Water Pollution staff provided a list of industrial impoundments which was updated (Appendix E). The Water Pollution files were searched and to complete the data needs a mail survey was conducted during spring 1979 followed by a telephone survey conducted during the fall 1979.

Oil and Gas

The oil and gas companies operating in the state were determined from a list provided by the Utah Oil, Gas, and Mining Division. This list included the number of oil and gas wells operating in the state as of February 1979 (Appendix E). The number of impoundments for oil and gas wells was taken to be one emergency overflow pit for each oil well. The operating and producible wells were categorized by company and field. Individual

company fields were chosen randomly to be assessed as a group. Random selection of these sites was accomplished using a random numbers table (Dixon and Massey, 1969).

Agriculture

The list of agricultural impoundments in this state was obtained from the Utah Bureau of Water Pollution Control (Appendix E). Their estimate was obtained through the Soil Conservation Service. A preliminary survey conducted by Geraghty & Miller, Inc. (U.S. EPA, 1978) indicated 234 agricultural impoundments in Utah. After contacting the three regional offices in Utah it appeared that an error in definition caused the discrepancy in the original estimate by Geraghty & Miller, Inc. The impoundments produced by the Utah Bureau of Water Pollution Control were used for this study. A telephone survey during fall 1979 was utilized to collect these data.

Mining

The list of mining facilities was provided by the Utah Bureau of Water Pollution Control (Appendix E). The data from their files were expanded by a written survey conducted during spring 1979 followed by a telephone survey conducted during fall 1979.

Assessment

The lists provided by the state personnel were used as a basis for the written and telephone surveys. The lists alone did not provide enough information to complete a section one form (Appendix G) and thereby locate the sites. Therefore written surveys were sent to all of listed sites for which a mailing address could be located. The surveys returned with inadequate information were located by a section one form. The surveys returned with adequate information were assessed by filing section two forms (Appendix G).

The well log files of the Utah Water Rights Division were used to determine the depth to groundwater, type of unsaturated zone, groundwater availability, and groundwater quality. The latest well logs were used for each site that was assessed.

The waste hazard potential rating was obtained from the SIA manual. The health hazard potential data were obtained using 7 1/2 minute topographic maps. These data were then interpreted in accordance with Silka and Swearinger (1978, Appendix F).

The state personnel were directly involved with the report process.

Information was gathered from them by personal and telephone interviews. The information included in Chapters 7 and 8 are a compilation of written communication by the cited state personnel.

Quality Control

The lists of impoundments identified by category were verified by state personnel. The lists of municipal, agricultural, and industrial impoundments identified in Utah were sent to the Utah Bureau of Water Pollution Control for verification. The list of oil and gas wells was verified by the Utah Division of Oil, Gas, and Mining.

The state copies of the assessment forms were checked for accuracy during the compilation of the final report.

DISCUSSION

There was an overall lack of available information encountered which hindered data accumulation during this project. The information requested for the SIA was either not regarded as important or had not been previously requested. This project attempted to provide a consistent list of information that may be used to assess future impoundment systems.

CHAPTER 4

PRESENTATION AND ANALYSIS OF DATA

The groundwater data in the state is poor. Well log information is available where there is usage but in outlying areas it is generally absent. Due to the scarcity of rainfall, groundwater is used for irrigation as well as culinary purposes. Therefore, contamination of shallow aquifers could affect culinary, irrigation and livestock watering practices.

IMPOUNDMENT QUANTIFICATION AND LOCATION

During this assessment additional municipal and oil and gas waste disposal impoundments have been identified (Table 1). These impoundments have been located within the state (Figure 1). The municipal systems are scattered throughout the state. The industrial systems are found mainly on the Wasatch Front, with a few located in the oil, gas, and coal regions to the east and southcentral parts of the state. The agricultural impoundments are found scattered across the western portion of the state. The majority of these impoundments are used to collect wash down water from dairy barns. One impoundment collects poultry waste and one impoundment collects swine waste. The original estimate of agricultural impoundments was 234 for Utah. However Richard B. Marston of the Utah Bureau of Water Pollution Control located only 16 sites. Geraghty and Miller, Inc. of Tampa, Florida, was contacted to inquire where they received their agricultural impoundment number for the Preliminary Survey for the SIA program (U.S. EPA, 1978). They stated their source of information was the Soil Conservation Service (SCS). The SCS regional offices in Utah were contacted and no one had knowledge of the preliminary survey. Also, the SCS could not explain or validate 234 agricultural impoundments in the state. Therefore, our survey

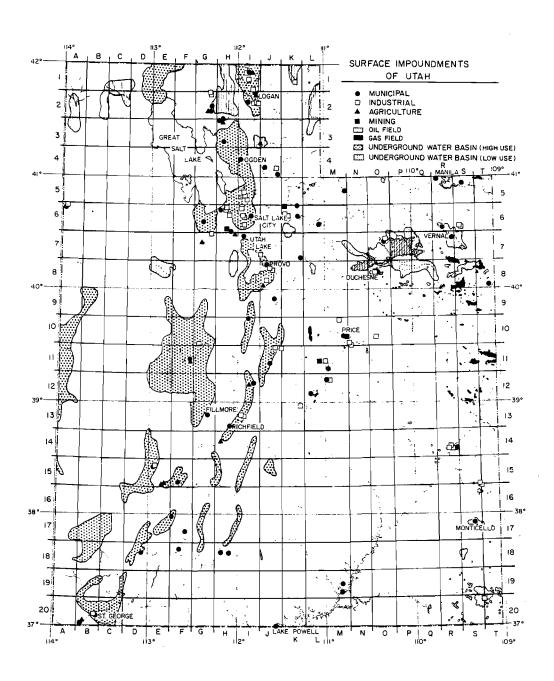


Figure 1. Locations of Surface Impoundments in the State of Utah

TABLE 1. SUMMARY OF PRELIMINARY SURVEY TO CURRENT STUDY OF IMPOUNDMENT SITES IN UTAH

	# of	# of Sites				
Category	Preliminary Survey (U.S. EPA, 1978)	Current Study				
Municipal	38	55				
Industrial	68	38				
Agricultural	234	6				
Oil & Gas	317 (# of imp	ooundments) 423				
Mining	3	3				

was based on Richard Marston's number for agricultural impoundments. He was at that time in charge of agricultural impoundments for the Utah Bureau of Water Pollution Control.

The oil and gas sites were originally estimated at 317 (U.S. EPA, 1978). However every oil well must have an emergency overflow pit and there are 1845 wells identified by the Utah Division of Oil, Gas, and Mining (Appendix F). It was decided to randomly assess the fields instead of individual sites. These oil fields are usually remote and accurate information was difficult if not impossible to obtain. There have been problems with contamination associated with oil and gas wells but it is usually associated with the disposal of brines by independent truckers in abandoned gravel pits.

ASSESSMENT DATA COLLECTION

The majority of these assessments were made on the basis of well logs, topographic maps, and both written and telephone surveys. Groundwater monitoring systems are found on very few disposal systems. The groundwater at sites containing toxic and radioactive waste is monitored while municipal and low grade industrial waste is not monitored for groundwater contamination.

The percentage of the sites and impoundments assessed was summarized by category (Table 2). The written surveys which were sent to the parties in charge of the sites to be assessed were returned at a low percentage. The parties which did not return the written surveys were then contacted by phone. The phone survey also provided a low return percentage. The agricultural, municipal, industrial and mining sites missing from the assessment were not assessed due to the lack of a survey return. Some of the oil and gas sites randomly chosen for the assessment were not assessed due to the lack of well log data and exact location of the wells within large oil field areas.

ASSESSMENT DATA ANALYSES

A summary of the parameters used in each step of the assessment is provided in Appendix A. This information is provided to aid in the interpretation of the listing of all of the assessment data collected in Appendix B. The listings provided in Appendix B were generated with the FORTRAN program listed in Appendix C.

Pollution Potential

The pollution potential index (step 5 value) is the sum of the first four steps. The majority of the impoundment sites assessed yielded pollution potentials

TABLE 2. SUMMARY OF THE SITES AND IMPOUNDMENTS LOCATED AND ASSESSED

G. F.	N	umber of S	ites	Number of Impoundments			
Category	Located	Assessed	% Assessed	Located	Assessed	% Assessed	
Municipal	 55	44	80	217	190	88	
Industrial	38	31	82	100	86	86	
Agricultural	6	6	100	8	8	100	
Mining	3	1	33	7	4	57	
Oil & Gas	37	37	100	423	423	100	

less than 20 (Table 3). The industrial sites tended to have an increased pollution potential value because of the type of wastes being handled. Complete listings of these sites can be found in Appendix B identified by the same code.

These sites have been further reduced into the number of impoundments valued at specific pollution potentials (Figure 2). These impoundments are identified by category showing a general mixture of categories and pollution potentials.

Health Hazard

The health hazard (Step 6 value) is based on the proximity of an impoundment to a water well and the anticipated direction of movement of the waste plume. The sites assessed have been identified by their category and number (Table 4). Five sites were identified as the worst potential health hazards with a 7A rating. No 9A rated sites were identified. A large number of the oil and gas sites was classed as the lowest priority (OD) for the health hazard rating.

These sites have been further reduced into the number of impoundments valued at specific health hazard ratings (Figure 3). These impoundments are identified by category. This again displays the large number of oil and gas impoundments that were assessed as the lowest priority for the health hazard rating.

Confidence Ratings

Confidence ratings were determined for each step of the assessments except step 5. The determination of these ratings is summarized in Appendix A. They were generally chosen from one of three categories: A, B, or C; with A being the highest confidence and C being the lowest confidence. The percentage of sites represented by each confidence rating for each step of the assessment has been tabulated (Table 5).

TABLE 3. THE POLLUTION POTENTIAL INDEX (STEP 5) AND SITE IDENTIFICATION CODE

							Pol1	lution Po	tential	Value				<u> </u>	2	
	11	12	13	14	.15	16	17	18	19	20	21	22	23	24	25	26
Oil & Gas	O&G 2			0&G 120 0&G 116	0&G 30 0&G 8	O&G 65 O&G 52 O&G 51 O&G 50 O&G 49 O&G 16 O&G 15 O&G 14 O&G 13 O&G 12	0&G 45 0&G 6	0&G 131 0&G 126 0&G 97 0&G 95 0&G 93 0&G 73 0&G 11		0&G 10	0&G 1			0&G 20	O&G 7 O&G 4 O&G 3	0&G 1 0&G 1
	gricultu Mining	ral						AGR 7 AGR 4	MIN 2	AGR 5 AGR 1			AGR 6	AGR 3		
Industrial	IND 18 IND 4		IND 23 IND 20 IND 1		IND 31 IND 19 IND 3 IND 2	IND 38 IND 28 IND 16 IND 15 IND 13 IND 11	IND 29 IND 17 IND 8	IND 30	IND 33 IND 27 IND 25	IND 37	IND 22	IND 39 IND 26 IND 24 IND 10 IND 7	IND 9 IND 5			
Municipal	MUN 42 MUN 35		MUN 49 MUN 21	MUN 43 MUN 36 MUN 28 MUN 8	MUN 41 MUN 33	MUN 27 MUN 11	MUN 54 MUN 32 MUN 31 MUN 22 MUN 9 MUN 4	MUN 26 MUN 16 MUN 13 MUN 7 MUN 2	MUN 53 MUN 51 MUN 47 MUN 46 MUN 45 MUN 37 MUN 30 MUN 24 MUN 23 MUN 19	MUN 39 MUN 38 MUN 25	MUN 44 MUN 3, MUN 1	MUN 17	MUN 52 MUN 29 MUN 10	MUN 15		

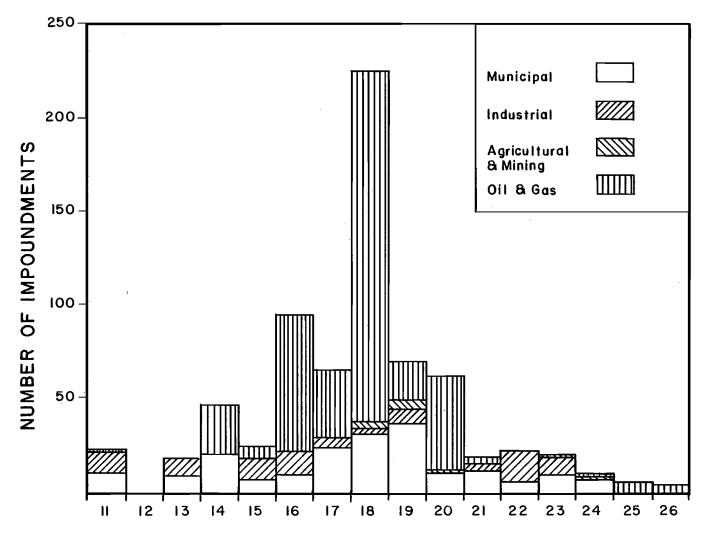


Figure 2. The pollution potential index (Step 5) and the number of impoundments.

TABLE 4. THE HEALTH HAZARD (STEP 6) AND THE SITE IDENTIFICATION CODE

 	r			
Distance (Meters)	CASE A Highest Priority: Rate the closest water well within 1600 meters of the site that is in the anticipated direction of waste plume movement.	CASE B Second Priority: If there is no well satisfying Case A, rate the closest surface water within 1600 meters of the site that is in the articipated direction of the waste phone inovenient.	CASE C Third Priority: If no surface water or water well satisfying Case A or B exists, rate the closest water supply well as surface water supply within 1600 meters of the atte that is not to the antiched meters of the attention of water blume movement.	CASE D Lowest Priority: If there are no surface waters or water wells within 1600 meters of the site in any direction, rate the site as "OD."
≤ 200	94	88	70	Municipal = Mun Industrial = Ind Agricultural = Agr Mining = Min Oil & Gas = O&G
. > 200, ≤ 400	Mun 22 30 ——————————————————————————————————	Mun 7 17 24 17 29 15 20	Ind 7	·
> 400, ≤ 800	Mun 11 Ind 4 19 8 23 10 27 25 29 31 31 Agr 1 42 42 44 O&G 20	4B Mun 2 Mun 38 Iad 24 3 4 4 3 27 9 45 28 10 51 16 51 19 26 28 28 28 33 Ind 2 Min 2	Ind II	
> 800. ≤ 1600	Mun 1 Agr 5 25 7 36	28 Mun 8 37 47 - 52 10d 16 22 29 30	IC Mun 13 15 41 46 Agr 4	
> 1600		<u></u>		OD

DISTANCE (meters)	CASE A	CASE B	CASE C	CASE D
≤ 200	9A	88	7C	Municipal
				Industrial
>200, ≤400	7A	6B	5C	Agricultural 8 Mining Oil 8 Gas
	5A	4B	3C	One square is equivalent to IO impoundments
>400, ≤800				mpountaments
>800, ≤1600	AE	2B	IC	 -
>1600		—	_	0 D

Figure 3. The health hazard (Step 6) and the number of impoundments.

TABLE 5. SUMMARY OF THE CONFIDENCE RATINGS FOR EACH ASSESSMENT STEP

Assessme	ent Step and Category	P	ercentage of Sites Degree of Confi	
		A	В	С
Step 1:	Unsaturated Zone			_
	Municipal	77	23	0
	Industrial	93	7	0
	Agricultural	50 0	33 100	17 0
	Mining Oil & Gas	30		0
All Cate	egories Combined (STEP 1)	64	35	1
Step 2:	Groundwater Availability			<u>. </u>
-	Municipal	80	20	0
	Industrial	93	7	0
	Agricultural	67	33	0
	Mining	0	100	0
_	Oil & Gas	0	100	0
All Cate	egories Combined (STEP 2)	57	43	0
Step 3:	- · · · · · · · · · · · · · · · · · · ·			
	Municipal	86	14	0
	Industrial	87	13	0
	Agricultural	83	17	0
	Mining Oil & Gas	100 54	0 46	0
All Cate	egories Combined (STEP 3)	76	24	0
Step 4:	Waste Hazard Potential			
	Municipal	25	75	
	Industrial	53	47	
	Agricultural	83	17	
	Mining	0	100	
	Oil & Gas	0	100	
All Cate	egories Combined (STEP 4)	27	73	·
Step 5:	Pollution Potential	No	confidence rating	assigned
Step 6:	Health Hazard			
=	Municipal	0	93	7
	Industrial	7	93	0
	Agricultural	0	83	17
	Mining	0	100	0
	Oil & Gas	0	3	97
All Cate	gories Combined (STEP 6)	2	64	34

Each step of the assessments has been separated into groups of matching confidence ratings (Table 6). Each entry has the site identification number separated by a dash from the following assessment value for that site.

CONCLUSIONS

A pollution potential greater than 19 could denote a site which may pose a threat to groundwater supplies. A total of 34 sites (154 impoundments) were identified with pollution potentials greater than 19 (Table 7). Of these 34 sites, 13 sites (35 impoundments) were also rated as a case A with regard to the health hazard step. A combination of these two ratings would denote impoundments which may pose a serious threat to groundwater supplies.

TABLE 6. CONFIDENCE RATINGS FOR EACH STEP OF THE ASSESSMENT

MUNICIPAL

			Degree of Confidence Rating	
	A		В	c
STEP 1 Unsaturated Zone	3-9C 16-6C 28-2D 4 4-5C 19-5C 29-9B 7-6C 21-0E 30-7C 8-2D 22-5C 31-5C 9-5C 23-5C 33-3D	43-2E 44-9A 45-5C 46-9C 47-8B 52-9B 54-5C 34	2-6B 53-7B 17-9C 32-5C 36-2D 37-7B 38-8B 39-7B 49-3D 51-7B Total	0 Total
STEP 2 Groundwater Availability	3-3A 16-3A 28-3C 4 4-3C 19-5A 29-5A 7 -3C 21-4C 30-3C 4 8-3C 22-3C 31-3C 4 9-3C 23-5A 33-3C 4 10-5A 24-3A 35-1E	43-3C 44-3C 45-5A 46-3C 47-3A 49-3C 52-5A 54-30 35	2-3A 17-5A 32-3C 36-3A 37-3A 38-3A 39-3A 51-3A 9 53-3A	0 Total
STEP 3 Groundwater Quality	1.5 16.5 31.5 45.5 2.5 19.5 32.5 46.5 3.5 21.5 33.5 52.5 4.5 22.5 35.5 53.5 7.5 23.5 37.5 54.5 8.5 24.5 38.5 9.5 25.5 39.5 10.5 26.5 41.5 11.5 27.5 42.5 13.5 28.5 43.5 13.5 28.5 43.5 13.5 28.5 43.5	38 Total	17-4 29-5 36-5 47-4 49-3 51-5	0 Total
STEP 4 Waste Hazard Potential	74 104 11-4 11-4 11-4 11-4 19-4 22-4 23-4 26-4 28-4 30-4 31-4	11 Totał	1.4 21.4 37.4 47.4 2.4 24.4 38.4 49.4 3.4 25.4 39.4 51.4 4.4 27.4 41.4 52.4 8.4 29.4 42.4 53.4 9.4 32.4 43.4 54.4 13.4 33.4 44.4 15.4 35.4 45.4 17.4 36.4 46.2 Total	No 'C' Rating for Step 4
STEP 6 Health Hazard		0 Total	1-3A 13-1C 27-5A 38-4B 49-4B 51-4B 51-4B	15-1C 25-3A 36-3A

Each entry is a site number - assessment value for that step.

TABLE 6. CONTINUED

OIL AND GAS

OIL AND GAS			
	A	В	c
STEP 1 Unsaturated Zone	18-9B 52-3D 19-9B 65-3D 20-9A 29-6C 30-2D 45-2D 49-3D 50-3D 11 Total	1-9B 10-5C 93-3D 2-1E 11-5C 95-3D 3-9B 12-3D 94-3D 4-9B 13-3D 114-4C 5-5C 14-3D 116-1E 6-3D 15-3D 120-1E 7-9B 16-3D 126-3D 8-2E 17-4C 131-3D 9-5C 73-3D Total	O Total
STEP 2 Groundwater Availability	0 Total	1-IE 10-3C 19-5A 65-IC 131-3C 2-IE 11-IC 20-3A 73-3C 3-5A 12-IC 29-IC 93-3C 4-5A 13-IC 30-IC 95-3C 5-3C 14-IC 45-3C 97-3C 6-3C 15-IC 49-IC 114-3C 7-5A 16-IC 50-IC 116-IC 8-IE 17-5A 51-IC 120-IC 9-3C 18-5A 52-IC 126-3C Total	0 Total
STEP 3 Groundwater Quality	18-5 52-5 126-5 19-5 65-5 131-5 20-5 73-5 29-5 93-5 30-5 95-5 49-5 114-5 50-5 116-5 20 Total	1-4 10-5 2-2 11-5 3-4 12-5 4-4 13-5 5-4 14-5 6-4 15-5 7-4 16-5 8-5 17-4 17 Total	0 Total
STEP 4 Wuste Hazard Potential	0 Total	1-2 10-7 19-7 65-7 131-7 2-7 11-7 20-7 73-7 3-7 12-7 29-7 93-7 4-7 13-7 30-7 95-7 5-7 14-7 45-7 97-7 6-7 15-7 49-7 114-7 7-7 16-7 50-7 116-7 8-7 17-7 51-7 120-7 9-7 18-7 52-7 126-7 Total	No 'C' Rating for Step 4
STEP 6 Health Hazard	O Total	20-5A	1-OD 10-OD 19-3A 73-OD 2-OD 11-OD 29-OD 93-OD 3-OD 12-OD 30-OD 95-OD 4-OD 13-OD 45-OD 97-OD 5-OD 14-OD 49-OD 114-OD 6-OD 15-OD 50-OD 116-OD 6-OD 15-OD 50-OD 116-OD 36-OD 17-OD 52-OD 120-OD 36-OD 17-OD 18-3A 65-OD 131-OD 31-OD 36-OD 31-OD 36-OD 31-OD 31-OD

Each entry is a site number-assessment value for that step

TABLE 6. CONTINUED

AGRICULTURAL AND MINING

		Degree of Confidence Rating	,
`	A	В	e
STEP 1 Unsaturated Zone	Agr 1-SC Agr 6-9A Agr 7-3D 3 Total	Min 2-7B Agr 3-9B Agr 5-4C	Agr 4-5C
STEP 2 Groundwater Availability	Agr 1-5A Agr 4-3C Agr 6-4C Agr 7-5A 4 Total	Min 2-3A Agr 3-5A Agr 5-6A Total	0 Total
STEP 3 Groundwater Quality	Min 2-5 Agr 1-5 Agr 4-5 Agr 5-5 Agr 6-5 Agr 7-5	Agr 3-5	0 Total
STEP 4 Wasic Hazard Potential	Agr 1-5 Agr 3-5 Agr 4-5 Agr 6-5 Agr 7-5	Min 24 Agr 5-5	No 'C' Rating for Step 4
STEP 6 Health Hazard	U Total	Min 2-4B Agr 1-5A Agr 3-7A Agr 5-3A Agr 6-4B Agr 7-3A	Agr 4-1C

Each entry is a site number-assessment value for that step

TABLE 6. CONTINUED

INDUSTRIAL

		Degree of Confidence Rating													
			A	<u>.</u>					В					С	
STEP 1 Unsaturated Zone	1-4D 2-5C 3-3E 4-OE 5-5C 7-4C 8-4D 9-5C 10-4C	11-4C 15-6C 16-4D 17-5C 18-1E 19-1E 20-3D 22-4C 23-OE	25-4C 27-5C 28-4C 29-4D 30-3D 31-5C 33-4C 37-5C 38-4C	39-4C	/	28 Total	13-2D 24-9C				2 Total				0 Total
STEP 2 Groundwater Availability	1-1C 2-3A 3-4C 4-3A 5-5A 7-5A 8-3C 9-5A 10-5A	11-5A 15-1E 16-1C 17-3C 18-1E 19-5A 20-4C 22-5A 23-3A	25-5A 27-5A 28-5A 29-3C 30-5A 31-3C 33-5A 37-5A 38-5A	39-5 A	/	28 Total	13-1E 24-5A				2 Total				0 Total
STEP 3 Groundwater Quality	2-5 3-2 4-5 5-5 7-5 8-5 9-5 10-5 11-5	15-5 17-5 18-5 19-5 20-5 22-5 23-5 25-5 27-5	28-5 29-5 30-5 31-5 33-5 37-5 38-5 39-5			26 Total	1-4 13-5 16-4 24-4				4 Total				0 Total
STEP 4 Waste Hazard Potential	4-3 7-8 8-5 10-8 11-2 13-8 17-4 18-4 23-5	27-4 28-2 29-5 31-2 33-5 38-2 39-8				16 Total	1-4 2-2 3-6 5-8 9-8 15-4 16-7 19-3 20-1	22-7 24-4 25-5 30-5 37-5			14 Total	No	'C' Rating for Sw	ер 4	
STEP 6 Health Hazard	1-3A 3-OD				/	2 Total	2-4B 4-5A 5-6B 7-4C 8-5A 9-6B 10-5B 11-3C 13-3A	15-6B 16-2B 17-7A 18-8B 19-7B 20-6B 22-2B 23-5A 24-6B	25-4B 27-4B 28-4B 29-2B 30-2B 31-4B 33-3C 37-3A 38-8B	39-4B	28 Total				0 Total

Each entry is a site number-assessment value for that step

TABLE 7. SUMMARY OF ASSESSED SURFACE IMPOUNDMENTS WITH OVERALL GROUNDWATER CONTAMINATION POTENTIAL GREATER THAN 19

Category	Site #	# of Impoundments Per Site	Groundwater Contamination Potential	Potential* Endangermen To Current Water Supplies
Municipal	1	3	21	3A
	3	4	21	4B
	10	2	23	4B
	15	8	24	ic
	17	6	22	6B
	25	3	20	3A
	29	6	23	. 5A
	38	Z T	20 20	4 B 4B
	39 44	2 1 5 3	20 21	5A
	52	3	23	2B
Total	ll Sites	43 Impoundments		_
Industrial	5	6	23	6B
	7	3	22	4C
	9	3	23	6B
	10	3	22	5A
	22	3	21	2B
	24	4	22	6B
	26	5	22	3A
	37	1	20	3A
	39	2	22	4B
Total	9 Sites	30 Impoundments	-	-
Agricultural	1	1	20	5A
	3	1	24	7A
	5	1	20	3A
	6 _	· 1	23	4B
Total	4 Sites	4 Impoundments	Ann	-
Oil & Gas	1	3**	21	OD
	3	2	25	OD
	4	3	25	OD
	7	2	25	OD
	9	27	20	OD
	10	- 4	20	OD
	17	30	20	OD
	18	4	26	3A
	19 20	1	26 24	3A 5A
Total	10 Sites	77 Impoundments	-	_

 $\ensuremath{^{\star}}\xspace$ Rating the potential endangerment to a water supply (Silka and Swearingen, 1978).

Case A - Highest Priority: Rate the closest water well within 1600 meters of the site that is in the anticipated direction of waste plume movement.

Case 8 - Second Priority: If there is no well satisfying Case A, rate the closest surface water within 1600 meters of the site that is in the anticipated direction of the waste plume movement.

Case C - Third Priority: If no surface water or water well satisfying Case A or B exists, rate the closest water supply well or surface water supply within 1600 meters of the site that is not in the anticipated direction of waste plume movement.

Case D - Lowest Priority: If there are no surface waters or water wells within 1600 meters of the site in any direction, rate the site as "OD."

Select the appropriate rating for the given distance and case:

Distance (Meters)	Case A	Case B	Case C	Case D	
≤ 200	9A	8B	7C	-	
>200, ≤ 400	7A	6B	5C	-	
>400, \$ 800	5A	4B	3C	_	
>800, ≤ 1600	3A	23	10	-	
>1600				OD	

**Assume one impoundment per well.

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CHAPTER 5

WATER TABLE AQUIFERS

General information on the unconfined aquifers in the State of Utah was acquired from reports on groundwater conditions in Utah which have been published every spring since 1961 by the Utah Department of Natural Resources, Division of Water Resources, in cooperation with the United States Geological Survey (Gates and others, 1978). Another major source of information on unconfined aquifers in this state was the Hydrologic Atlas of Utah (Jeppson et al., 1968).

Data were also collected from well logs at the Division of Water Rights for this state. The major problems that occurred with reliance on well logs were poor quality data and the dearth of well logs in the totally unpopulated areas of this state. The well logs for the municipal and industrial areas were generally sufficient to obtain reasonably reliable data for the aquifer evaluation in populated areas. In the mining and gas and oil areas well logs were essentially non-existent or if available only very sparse data were obtained. Most of these well logs indicated very deep wells and very poor descriptions were given from the ground to 30 meter depths. The wells in the oil and gas areas were primarily exploration wells for gas and oil. Thus the most reliable data would be near the more populated municipal areas whereas very little or marginal data were available for the gas, oil, and mining areas. Characteristically the well logs were recorded in the following depth ranges:

0 - 1 meter

1 - 3 meters

3 - 10 meters

10 - 30 meters

> 30 meters

Because most of the wells exhibited standing water levels greater than 10 meters, the precision of the data was less than desired. Also, a few of the well logs used dated back to approximately 1940. It would be expected that these well logs would be outdated due to drawdown in the aquifers mainly from high irrigational water use. In some cases shallow water is ignored when culinary water wells are being drilled to a greater depth. This may cause a false estimate of the shallow water aquifer level. Although unpopulated, the National Park sites all had at least 1-3 well logs from which to gather data. This was not the case for a few of the U.S. Forest Service sites in the Wasatch National Forest.

The location of surface impoundments has been illustrated with the locations of groundwater development (Figure 4). The base map used for the figure was a U.S. Geological Survey map (1-500,000 scale). The areas of groundwater development were superimposed from the first figure in Gates and others (1978). Most of the impoundments in the state occur in an area of groundwater development or next to surface water itself.

One of the more difficult tasks was to evaluate the well logs as there appears to be no standard technique for reporting data. It appears there should be some coordination and standardization in this area. It would also be extremely helpful if a long-term data base was being established and compiled on water quality of the groundwater within the state. This could possibly be coordinated with the semi-annual and continuous measurement of groundwater aquifer levels being done by the USGS.

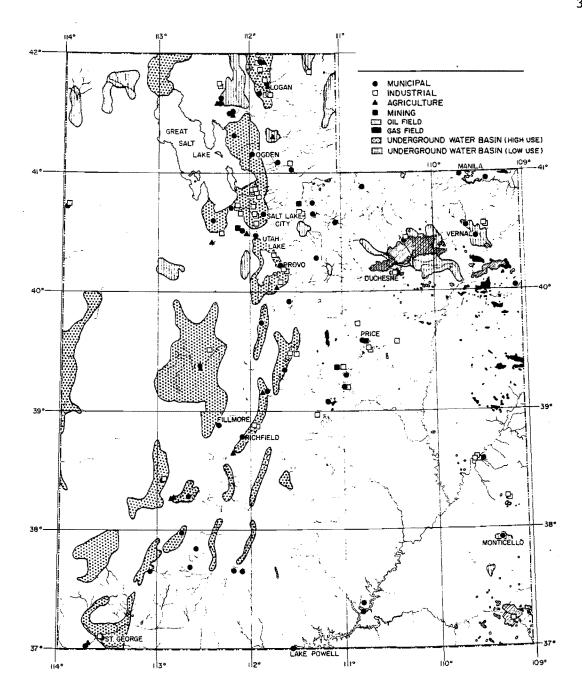


Figure 4. Areas of groundwater development with the locations of surface impoundments in the State of Utah.

CHAPTER 6

INSTANCES OF GROUNDWATER POLLUTION FROM

SURFACE IMPOUNDMENTS

There have been instances of groundwater pollution in the State of Utah.

The cases which will be discussed range from suspected cases to cases where legal action has been taken to resolve the problem. The two cases in which legal action have been taken were both related to the oil and gas industry in Utah.

OIL AND GAS INCIDENCES

Both of the legal actions were related to common carriers dumping oil waste off site from the oil and gas company sites (McNeal and Roberts, 1979). These trucking companies were hired to remove related oil waste which could not be reinjected at the oil drilling site. When these companies dispose of these oil wastes by dumping them in abandoned gravel pits or unlined pits, they have been requested by the Utah Water Pollution Committee to cease such practice. In both of these cases problems arose when these dumping practices contaminated private culinary water wells.

The first case is referred to as Pinder's Pits. Water samples from private culinary wells were analyzed at the Division of Health State Laboratory (Salt Lake City, Utah) in April, 1977. These samples were found to exceed maximum recommended concentrations prescribed in the U.S. Public Health Service Drinking Water Standards for the following constituents: TDS, Sulfate, Chloride, Total Iron, Manganese, and Turbidity. The Uintah County Sanitarian was notified of these results in writing. On March 15, 1977, Mr. Pinder of Trans Western Tankers, Inc. was notified by certified mail of a request by the Utah Water Pollution Committee to immediately cease all salinity waste disposal activities into these

pits. Waste disposal activities were concluded at that time. However, the owners of the private culinary water wells attempted to collect damages from Trans Western for their contaminated water supplies. This action ended in the Fourth Judicial District Court, Duchesne Court House on April 2, 1979. The defense lawyer showed that none of the plantiffs held legal water rights to their well water. Therefore the judge dismissed the case. No assessment was available for this site.

The second case occurred in Roosevelt as a civil court proceedings against Western Petroleum, another common carrier company. A letter was sent to Western Petroleum during 1977 by the state stating that the disposal site being utilized by Western Petroleum was not an authorized disposal site. Another letter was sent during Spring, 1979, advising them to cease operations. The company was operating without a permit and the disposal site was not appropriate. Residents who lived in the area had well water samples analyzed at both the Division of Health State and Ford Laboratories (SLC). They took Western Petroleum to court for damages. These residents had had legal rights to the water for some time. They were awarded \$30,000 in damages by the jury. Western Petroleum was penalized every time they dump at the site. They have purchased another site for disposal purposes. These plans are currently being reviewed by the state. No assessment was available for this site.

The entire Uintah Basin area is dotted with these trucking firms. Because of the lack of manpower, action taken has always been in response to complaints. There is also a lack of baseline groundwater quality data and detailed geological information available. This creates problems in establishing responsibility for contamination problems.

A third incident involving a private culinary water well occurred in the Uintah Basin. Mrs. George Fisher, who lives 1.5 miles north of Altamount,

complained during November, 1977, that her laundry was turning orange and her water tasted badly (Mike Thompson, 1979). A Chevron drilling rig was located 1/4 mile from her water well. The State Sanitarian in Vernal was contacted. He could find no source of contamination from the Chevron site. The pits at the drilling site were filled and the problem is improving. Chevron was cooperative in this incident. The Chevron wells in this area were assessed and are identified as Oil and Gas site 50. The groundwater contamination potential was 16 and the potential health hazard was OD in this assessment.

INDUSTRIAL INCIDENCES

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The state is currently investigating a site in Salt Lake City owned by Amoco Oil Company used for oil sludge waste disposal (McNeal and Roberts, 1979). This site was approved ten years ago, but the Amoco 1979 reply to the state did not provide information about any sealing material which might have been used for the oil sludge disposal. This case may go into legal action. This site was assessed as Industrial site 39. The inquiry about the type of bottom liner was left unanswered on the assessment form. The assessment yielded a groundwater contamination potential of 22 and a health hazard of 4B.

Two Uranium and Vanadium processing plants have waste impoundments which may pose problems (McNeal and Roberts, 1979). The first site belongs to Rio Algom, Moab, (Industrial site 6). This site has been located but enough information was not available to assess it. The waste impoundments may be unlined but no pond has greater than 15 acres of surface area. The NRC has been contacted by the state requesting information on the Rio Algom site. But the state has received no information from them. The second site is owned by Atlas Minerals of Moab. There was not enough information available to identify this site. It is located close enough to the Colorado River that a 50 year flood reaches the base of the

waste impoundments. One monitoring well near a tailings pond has shown increased radioactivity entering the groundwater.

A municipal water source in Elberta was contaminated with high levels of TDS, nitrates, magnesium and iron (Georgeson, 1979a). Elberta developed a new well for its culinary water supply. There are mine drainage ponds above Elberta which are owned by Kennecott Copper Corporation. However no action could be taken because there was no baseline data for the town's water supply. A comparative analysis of Elberta well and the mine drainage ponds did not indicate similar chemical ratios. At this point we have no explanation for the contamination, unless it is of natural origin. This site was not identified in the assessment process. The only site located and assessed which is owned by Kennecott Copper Corporation is in Magna (Industrial site 3).

The Colorado River Salinity Control Act of 1974 limits effluents from industrial discharges. The waste impoundments operated by Utah Power and Light at Huntington (Industrial site 24) within the Colorado River drainage area are total containment ponds. However, some of the water from these ponds are used for irrigation at an experimental farm (McNeal and Roberts, 1979). Salt precipitation (gypsum) occurs at the soil surface from this practice. This may be contributing to the salinity of the groundwater in the area, but this practice was proceeding two to three years before baseline data were gathered. Therefore, it is difficult to assess the impact of this practice. The Utah Power and Light Huntington ponds were originally to be total containment ponds. Data recently supplied by Utah Power and Light indicates that the naturally occurring groundwater in the farm area has a TDS greater than 1000 mg/l. The assessment for this site yielded a groundwater pollution potential of 22 and a health hazard rating of 6B.

MUNICIPAL INCIDENCES

An irrigation reservoir was constructed over the spring which is the water supply for Newcastle (Georgeson, 1979a). Since construction of the reservoir, there have been complaints by Newcastle residents of taste and odor problems associated with their water. This water is treated by sand filtration before distribution. This incident is not related to waste impoundments and so no site was identified for assessment purposes.

In the Cedar City Valley the water supplies of four cities were contaminated by elevated nitrate levels (Georgeson, 1979a). This contamination may have been from natural causes. A sewage treatment method used in this area is land application. Before application, the sewage is stored in a pond. The original pond in this system, which leaked badly, has subsequently been replaced by a new system. As a result of an on-going monitoring project in the Cedar Valley any suspicions that the nitrate contamination in the wells is a result of the land application of sewage treatment plant effluent or its storage have been eliminated. This site was not identified during the assessment process.

CHAPTER 7

EVALUATION OF EXISTING STATE PROGRAMS

The Utah State Board of Health is a body politic recommended by the Governor and approved by the Utah Senate that serves as the regulatory authority for the State Department of Health (Holt, 1979). Regulatory and enforcement authority is vested in the State Board of Health by Section 26-15-5 of the Utah Code Annotated, 1953, as amended. Additional regulatory committees have been authorized by state law to promulgate rules for the control of specific health or environmental programs as have been deemed necessary with increasing demands on the state's natural resources and environmental protection programs (Figure 5).

The state water pollution control organization consists of the Division of Environmental Health within the State Health Department (Pitkin, 1979). The Division of Environmental Health (Figure 6) includes Bureaus of Water Pollution Control, Public Water Supply, and Solid Waste Management, each working under separate state legislative authority and under separate federal acts: The Federal Clean Water Act, the Safe Drinking Water Act, and the Resource Conservation and Recovery Act. The organization of the state environment health programs is currently under review by a state appointed reorganization committee. Therefore, this organization may change within the near future (Dalley, 1980).

Under present Health Department policy, the Bureau of Water Pollution

Control has been designated as the lead agency for conducting the permitting

and operational requirements for pits, ponds and lagoons and for the

construction of facilities for the containment of sludges from water and

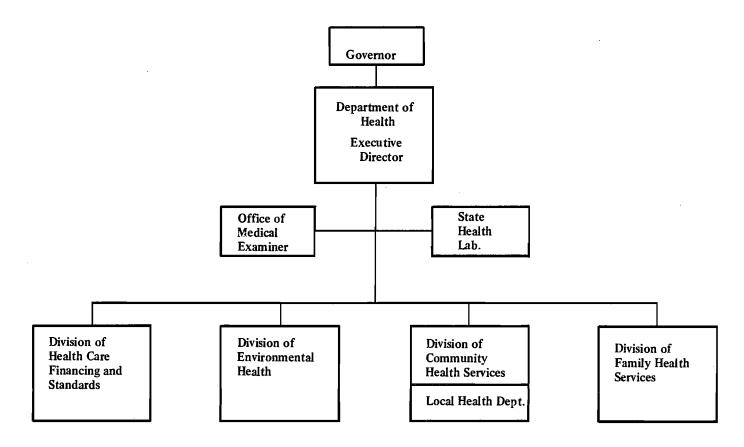


Figure 5. Utah Dept. of Health Organization Chart.

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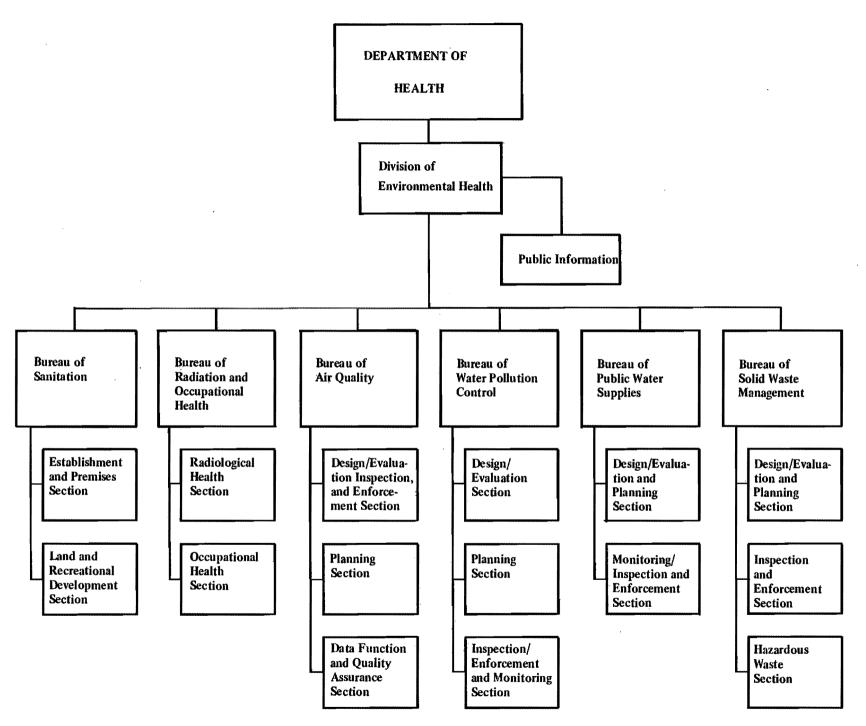


Figure 6. Organization of the Division of Environmental Health.

sewage treatment plants (Holt, 1979). It should be understood, however, that a dual regulatory responsibility exists between the Bureaus of Water Pollution Control and Solid Waste Management for control and disposal of sewage and wastewater sludges. The Bureau of Solid Waste Management presently assumes a significant role in establishing policy for the management of sewage and water treatment sludge. The Solid Waste Bureau is currently conducting a study into the final disposal of treatment sludges for inventory and health purposes.

BUREAU OF WATER POLLUTION CONTROL

The Bureau of Water Pollution Control operates under the Water Pollution Committee which has the statutory authority to conduct the water pollution control program in the state (Pitkin, 1979). This committee is made up of nine members appointed by the governor, and makes policies and adopts regulations to implement the state law.

Institutional Framework

The Utah Water Pollution Committee has the responsibility and authority to conduct a water pollution control program for waters of the state under Sections 73-14-1 through 73-14-13 of the Utah Code Annotated, 1953, as amended. Programs and regulations have been developed to control point source discharges of pollution to surface waters of the state. Control of discharges to groundwater has been controlled primarily through regulations for the construction of subsurface disposal systems for sanitary wastes (septic tanks and drainfields) and sealing of lagoons to minimize seepage.

Organization

Proposals to inject liquids into underground strata have been dealt with on a case-by-case basis which has effectively resulted in a prohibition of

any injection (as opposed to percolation) of wastes into the ground, or any injection of water into an aquifer of higher quality than that of the injected water. An Underground Injection Control Program is being developed by the state in accordance with the Federal Underground Injection Control Regulations pursuant to the Federal Safe Drinking Water Act.

Control of pollution to surface and underground waters from nonpoint sources is much more complex and authority is somewhat ambiguous. Nonpoint sources of pollution are being dealt with primarily under the 208 program pursuant to the Federal Clean Water Act. Local 208 agencies have developed and are developing control plans including implementation of best management practices to mitigate pollution from nonpoint sources, primarily land runoff whether urban or agricultural.

Monitoring Efforts

The Bureau of Water Pollution Control has had a monitoring program for surface waters for many years. However, surface impoundments of wastewaters have been routinely monitored only if there was a discharge to waters of the state. Other types of totally contained waste impoundments have not been routinely monitored by the Bureau of Water Pollution Control. Groundwater quality data have come mostly from tests conducted on new culinary water wells and these data are handled by the Bureau of Public Water Supplies.

Enforcement History

The State Health Department has taken legal enforcement action infrequently and only as a last resort to obtain compliance with the law. For the most part requiring strict adherence to adopted regulations has prevented many problems from ever developing; where this has failed, good faith negotiations have usually resolved the problem.

State regulations for surface impoundment of wastes require that only minimal percolation be allowed (less than 1/4" per day). Usually this is used in cases of sanitary wastewater ponds where slow percolation through tight soil will tend to purify the water. Various industrial wastes are dealt with on a case-by-case basis. If a waste is composed of conventional pollutants then some minor percolation can be allowed but if the wastes are toxic, or in some cases contain high levels of total dissolved solids, impermeable liners would be required and/or monitoring wells surrounding the ponds to give warning of any pollution of groundwater. Rapid percolation of wastewater as a waste treatment method has not been generally accepted in the state. Wastewater is required to be adequately treated before being allowed to percolate freely through porous soils. At the present time, no state legislation is pending.

BUREAU OF SOLID WASTE MANAGEMENT

The Bureau of Solid Waste Management has the state administrative responsibility for the control, regulation, management and disposal of all solid and hazardous waste materials, excluding radioactive wastes, generated within the State of Utah (Holt, 1979). This responsibility includes regulatory control over existing waste disposal sites as well as those that may have been abandoned and also includes the approval authority for all new landfill sites and proposed resource recovery projects.

Institutional Framework

The Bureau of Solid Waste Management is authorized to control solid waste disposal and solid waste disposal sites through regulatory measures

promulgated in the Utah Code of Solid Waste Disposal Regulations, adopted by the Utah State Board of Health, July 17, 1974. This Code is the legal set of regulations for use by Bureau staff in the principal source of solid waste policies for safe management and disposal of waste materials.

Organization

The Bureau of Solid Waste Management is extensively involved in the state groundwater protection program in coordination with the 208 water pollution control program and the Clean Water Act. The Bureau has provided comments and technical assistance to the Bureau of Water Pollution Control and Public Water Supplies. The Code of Solid Waste Disposal Regulations requires that all approved waste disposal sites be located in areas that will prevent groundwater contamination and the pollution of surface waters.

Monitoring Efforts

The Bureau is continually working with elected officials, private operators and various levels of government involved in solid waste pickup and disposal to upgrade or close dump sites that are sources of potential contamination to surface and groundwater. The Bureau of Solid Waste Management maintains a constant cooperative liaison with the other Bureaus involved with controlling the environmental quality of the water sources and surface impoundments of the state.

Any dump site or landfill that poses existing or potential health hazards to groundwaters or pollution of surface waters of the state is being identified and the responsible persons or agencies are notified concerning the problems. The Bureau is providing maximum technical assistance wherever possible to relocate these dumps and prevent future contamination.

Enforcement History

The Bureau of Solid Waste Management has a regulatory interest in the management and control of pits, ponds and lagoons. The Code of Solid Waste Disposal Regulations makes specific reference to proper storage and disposal of all forms of waste materials. Special reference is documented in the solid waste code for the storage, handling and disposal of special and hazardous wastes. By regulatory definition, water and sewage treatment sludges are listed in the Code of Solid Waste Disposal Regulations as requiring special handling and disposal. Consequently the Bureau has interest in the inventory of all types of waste disposal lagoons.

BUREAU OF PUBLIC WATER SUPPLIES

The Bureau of Public Water Supplies regulates the health related concerns of public water supply systems in Utah (Georgeson, 1979). Public water supply systems are defined as those serving 15 or more residential connections or 25 or more people for at least 60 days annually. The regulations provide for standards for the design and construction of water system features, water quality and quantity, and monitoring.

The authority for these activities are Sections 26-36 and 26-15-4 & 5 UCA, 1953. Regulations have been adopted by the Utah State Board of Health and the Utah Safe Drinking Water Committee and became effective November 15, 1979.

Organization

The Bureau is now organized with a bureau director and two sections whose chiefs report to him. The two sections are Design/Evaluation and Monitoring/
Enforcement. There are two sanitarians whose tasks are monitoring and operator training and five public health engineers who review plans and specifications,

conduct sanitary surveys, and provide technical assistance. The engineers are assigned to work with the water systems in specific counties. This organization will very likely change in the future with the sections becoming more rigid.

Institutional Framework

The Bureau of Public Water Supplies is part of the Division of Environmental Health of the Utah State Department of Health. There are six bureaus within Environmental Health: Air Quality, Public Water Supplies, Radiation and Occupational Health, Sanitation, Solid Waste Management, and Water Pollution Control. The Bureaus provide an integrated approach to environmental health matters in the state.

Monitoring Efforts

All public water supply systems in the state are required to have water samples analyzed for bacteriologic quality each month. The number of samples required is determined by the population served. (The requirements are the same as the Safe Drinking Water Act regulations.) The quality is determined by the standards established by the Public Health Service and EPA's Interim Primary Drinking Water Regulations.

It has been the goal of the Bureau to analyze the chemical quality of each public water supply source in the state every three years. This goal has not been met but considerable effort has been made in this area in the past five years. Every source of water proposed for use in a public water supply system must meet chemical quality requirements. Recently those requirements have been the 1962 Public Health Service Drinking Water Standards. The requirements are now modifications of the SDWA's National Interim Drinking Water Standards.

Enforcement History

There have been a few instances in the history of the Bureau of Public Water Supplies where actions of the enforcement nature have been taken because of pits, ponds and lagoons. During the period 1965 - 1976, the chemical quality of water from the well serving the unincorporated community of Elberta deteriorated considerably. Ponds designed to hold mine drainage water located about 2 miles away from the well were suspected but no evidence to that effect was obtained.

The community of New Castle and Ogden City both had spring water sources which were inundated by irrigation reservoirs. The springs were redeveloped before being inundated with the object of retaining them as public water supply sources. These efforts were futile and the springs in both cases had to be abandoned primarily because of taste and odor problems.

A problem of nitrate contamination of well water sources in Cedar City Valley is now being investigated. One of the suspected sources of the nitrate has been a sewage effluent holding pond. However, the evidence gathered to date has not pointed in this direction.

OTHER AGENCIES

Other state agencies which are also concerned with surface impoundment include the Division of Water Rights and the Division of Water Resources, each with concerns with water rights and water quantity. The Division of Wildlife Resources also has concerns with respect to water quality but they have no direct control or authority.

SUMMARY

The general concern of the state is one of manpower problems. This manpower is necessary to enforce the current regulations but it is beyond the state budget at the present time. Otherwise, the interactions between agencies at the state level did not appear to suffer from any problems.

CHAPTER 8

EVALUATION OF EXISTING FEDERAL PROGRAMS

In general, the State of Utah is currently working with the federal government to implement state primacy in the federal programs which would concern the protection of groundwater from surface impoundments. Evaluation of the federal programs is difficult due to the short duration of most of the interactions between the state and the federal government regarding these programs. However the following comments were offered by the state agencies involved with the federal programs at the present time.

The Bureau of Public Water Supplies has not until very recently been involved in any federal program (Georgeson, 1979). Application was made to the EPA for primary enforcement responsibility (primacy) of the Safe Drinking Water Act. Utah was granted primacy under PL 93-523, "Safe Drinking Water Act," effective February 28, 1980. This program falls under the Bureau of Public Water Supplies. The Bureau of Water Pollution Control is slated to have primacy for the underground injection control portion of the SDWA. Having had no experience with federal agencies controlling pits, ponds and lagoons, no evaluation can be offered.

The Bureau of Water Pollution Control would not be involved unless there is a discharge from a surface impoundment, because it would not come under the federal Clean Water Act (Pitkin, 1979). If there is a discharge then an NPDES Discharge Permit would be required and issued by EPA. Impoundments of hazardous wastes come under the Resource Conservation and Recovery Act and these programs are administered on a state level in the Bureau of Solid Waste Management.

The State of Utah and other appropriate governmental agencies are working with EPA through the regulatory procedure stipulated in the Resource

Conservation and Recovery Act to assume state control over the regulatory activities currently being promulgated by EPA (Holt, 1979). Utah has already initiated action to assume primacy with the passage of the Hazardous Waste Act of 1979, Utah Code Annotated, Sections 26-37-1 to 26-37-15, 1953, as amended. By provision of this act, the governor has appointed a Hazardous Waste Committee to promulgate rules and regulations for hazardous wastes control and to assume full authorization of the hazardous waste program as soon as the Environmental Protection Agency provides the appropriate guidance and approvals of application. The Hazardous Waste Committee presently has the regulatory authority to establish a control program over hazardous waste materials from their point of generation until they are properly disposed. The state is embarking on a course to assume all of the authority provided for in the Resource Conservation and Recovery Act. That authority includes issuance of facility permits for storage, treatment disposal facilities for hazardous wastes and for establishment of a manifest tracking requirement for transportation of wastes from generation to ultimate disposal.

The Division of Oil, Gas and Mining is currently working with the Bureau of Water Pollution Control to control discharge to underground water and discharge from surface impoundments by the issuance of NPDES Discharge Permits (Thompson, 1979). This appears to be adequate to protect the groundwater.

The Planning Section of the Bureau of Water Pollution Control assessed the groundwater for each 208 study area (Tate, 1979). This assessment was based on the available information at that time. Based on the available data, groundwater was not given a high priority in any study area. Most interest in groundwater was shown in Salt Lake County. A groundwater study

has been approved for Salt Lake County for fiscal year 1981 from 208 funds from fiscal year 1980.

The majority opinion expressed that the federal programs have provided adequate regulatory framework. The main problem is finding the man-power necessary to enforce the regulations already promulgated.

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APPENDIX A

DESCRIPTION OF CODES USED IN THE ASSESSMENT PROCEDURE

Appendix A

Summary Tables for the Evaluation of the Assessments (Silka and Swearingen, 1978)

Step 1. Rating of the Unsaturated Zone.

	Earth Material	1	11	111	I IV	v	VI
	,	'	•••	1 '''	"	'	71
ATEGORY	Jnconsolidated Rock	Gravel, Medium to Coarse Sand	Fine to Very Fine Sand	Sand with <15% clay, Silt	Sand with > 15% but ≤50% clay	lay with	Clay
DETERMINING	Lonsoffdated Rock	Cavernous or Fractured Limestone, Evaporites, Basalt Lava Fault Zones	Fractured Igneous and Metamorphic (Except Lava) Sandstone (Poorly Cemented)	Sandstone (Moderately Lemented) Fractured Shale	Sandstone (Well Cemented)	Siltstone	Unfractured Shale, Igneous and Metamorphic Rocks
HES FOR	Representative Permeability 2	>200	.2 - 200	0.2 - 2	< D. 2	< 0.02	< 0.602
GUIDEL	Permeability 2 in gpd/ft - in cm/sec -	-2 >10	10 - 10	-5 -4 10 - 10	-5 <10	-6 <10	-7 <10
		·····		RATING MATRIX			
	≥ >3 0	9 A	6В	4c	20 .	0E	OF
	± >10 ≤30	9в	7B	5C	30	· 1E	OG
	9 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	9c	8в	6C	40	2€	ОН
	Ckness of a turated of 5 0 < 1 > 0 < 1	90 .	9F	7C	50	3E	1F
	Thickness Unsaturati Heters)	9E	96	9н	91	93	9к

Step 2. Rating of the Ground Water Availability

Earth Material Category	1	f 1	111
Unconsolldated Rock	Gravel or sand	Sand with ≤50% clay	Clay with <50% sand
Consolidated Rock	Cavernous or Fractured Rock, Poorly Cemented Sandstone, Fault Zones	Moderately to . Well Cemented Sandstone, Fractured Shale	Siltstone, Unfractured Shale and other Impervious Rock
Representative Permeability			
in gpd/ft	>2	0.02 - 2	< 0.02
2 In gpd/ft In cm/sec	>10	10 -10	-6 4 10
	RATIN	MATRIX	
Thickness ≥ 30 of Saturated	6A	4C	2E
Zone 3-30 (Meters)	5A . ·	3C	1E
(neters; ≤3	3A	- 10 Me	OE

Step 1 confidence rating for determining the earth material of the unsaturated zone.

iturateu zone.	
Rating	Basis for Determination of Rating
A	Driller's logs containing reliable geologic
•	descriptions and water level data;
	U. S. Department of Agriculture soil survey
	used in conjunction with large scale, modern
	geologic maps.
	Published ground-water reports on the site.
В	Soil surveys or geologic maps used alone.
	General ground-water reports.
	Drillers' logs with generalized descriptions.
	Drillers logs or exposures such as deep road cuts near
•	the site of contamination allowing interpolation
	within the same general geologic unit.
С	On site examination with no subsurface data and no
	exposures of subsurface conditions nearby.
	Estimation of water levels or geology based on
	topography and climate.
	Extrapolations of well logs, road cuts, etc.
	where local geology is not well known.
	Estimation based on generalized geologic maps.
	Estimations based on topographic analysis.
Step 2 confidence	rating for determining the ground-water availability
ranking.	

This step involves the earth material categorization and thickness of the aquifer's saturated zone. The confidence rating for Step 2, Part A follows the same basis as Step 1, Part B above.

L p

Step 3. Rating the Ground-Water Quality

Rating	Quality
5	≤ 500 mg/1 TDS or a current drinking water source
4	>500 - \$1000 mg/1 TDS
3	>1000 - \$3000 mg/1 TDS.
2	>3000 - ≤10,000 mg/1 TDS
1	>10,000 mg/1 TDS
0	No ground water present

Step 3 confidence rating for determining background ground-water quality.

Rating	Basis for Determination of Rating
A	Water quality analyses indicative of background
	ground-water quality from wells at the site or
*	nearby wells or springs or known drinking water
	supply wells in vicinity.
В	Local, county, regional and other general hydro-
	geology reports published by State or Federal
	agencies on background water quality.
	Interpolation of background ground-water quality
	from base flow water quality analyses of nearby
	surface streams.
C	Estimates of background ground-water quality from
	mineral composition of aquifer earth material.

S IC Numb	er	Description of Waste Source	Hazard Potential Initial Rating
01		AGRICULTURAL PRODUCTION - CROPS	1-2
02		AGRICULTURAL PRODUCTION - LIVESTOCK	3
	021	Livestock, except Dairy, Poultry and	3
		Animal Specialties	(5 for Feedlots)
	024	Dairy Farms	4
	025	Poultry and Eggs	4
	027	Animal Specialties	2-4
	029	General Farms, Primarily Livestock	2
10		METAL MINING	
	101	Iron Ores	4
	102	Copper Ores	6
	103	Lead and Zinc Ores	5
	104	Gold and Silver Ores	6
	105	Bauxite and other Aluminum Ores	5
	106	Ferroalloy Ores Except Vanadium	5
	103	Metal Mining Services	4
	1092		6
	1094		7
	1099		5
			•
11		ANTHRACITE MINING	7
12		BITUMINOUS COAL AND LIGNITE MINING	7
_			•
13		OIL AND GAS EXTRACTION	
	131	Crude Petroleum and Natural Gas	7
	132	Natural Gas Liquids	,
	1381		6
	1382		
	1389		1
	1303		Variable depending
		classified	Activity
14,		MINING AND OHARBUTHG OF NON LOTHER TO WINDLESS	
		MINING AND QUARRYING OF NON-METALLIC MINERALS, EXCEPT FUELS	
	141	Dimension Store	•
	142		2
	144	Crushed and Broken Stone, Including Riprap	2
		Sand and Gravel	2
	145	Clay, Ceramic, and Refractory Minerals	2-5
	147	Chemical and Fertilizer Mineral Mining	4-7
	148	Nonmetallic Minerals Services	1-7
	149	Miscellaneous Non-metallic Minerals,	
		except Fuels	2-5
5		CONSTRUCTION OTHER THAN BUILDING CONSTRUCTION	
	1629	Heavy Construction, not elsewhere classified	
		(Dredging, especially in salt water)	4 .
0		FOOD AND KINDRED PRODUCTS	
	201	Meat Products	3
	202	Dairy Products	2
	203	Canned and Preserved Fruits and Vegetables	4
	204	Grain Mill Products	2
	205	Bakery Products	2
	206	Sugar and Confectionery Products	2
	207	Fats and Oils	3
	208	Beverages	
	209	Misc. Food Preparation and Kindred Products	2-5 2
	207	mos, roos reparation and kindred reducts	4
2	*	TEXTILE MILL PRODUCTS, ALL EXCEPT LISTINGS	
		BELOW HELD PRODUCTS, ALL EXCEPT LISTINGS	
	223	Broad Woven Fabric Mills, Wool (including	4
		dyeing and finishing)	6
	226		4
		Dying and Finishing Textiles, except Wool Fabrics and Knit Goods	6
	2295		e
	~~ 73	Coated Fabrics, Not Rubberized	6
		TIMBER AND HOOD BRODUCTO STORES STREET	
	241	LUMBER AND WOOD PRODUCTS, EXCEPT FURNITURE	2
	242	Logging Camps and Logging Contractors	2
		Sawmills and Planing Mills	2
	2435	Hardwood Veneer and Plywood	4
	2436	Softwood Veneer and Plywood.	4
	2439	Structural Wood Members, not elsewhere	3
		classified (laminated wood-glue)	
	2491	Wood Preserving	5
	2492	Particle Board	4
	2499	Wood Products, not elsewhere classified	2-5
		PAPER AND ALLIED PRODUCTS	
	261	Pulp Mills	6
		Pulp Mills Paper Mills Except Building Paper Mills	6 6

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		and the second second	Hazard Potential
SIC Number		Description of Waste Source	Initial Rating
28		CHEMICALS AND ALLIED PRODUCTS 1	
20	2812	Alkalies and Chlorine	7-9
	2813	Industrial Gases	
	2816	Inorganic Pigments	3-8
	2819	Industrial Inorganic Chemicals,	
		not elsewhere classified	3-9
	2821	Plastic Materials, Synthetic Resins, and	
		Nonvulcanizable Elastomers	6-8
	2922 2823	Synthetic Rubber (Vulcanizable Elastomers) Cellulose Man-Made Fibers	6-8 6-8
	2824	Synthetic Organic Fibers, except Cellulosic	6-8
	2831	Biological Products	6-9
	2833	Medicinal Chemicals and Botanical Products	3-8
	2834	Pharmaceutical Preparations	6-9
	2841	Soap and Other Detergents, except	
•		specialty cleaners	4-6
	2842	Specialty Cleaning, Polishing and	
		Sanitation Preparation	3-8
	2843	Surface Active Agents, Finishing Agents,	6-8
		Sulfonated Oils and Assistants	0-0
	2844	Perfumes, Cosmetics, and other Toilet Preparations	3-6
	2851	Psints, Varnisher, Lacquers, Enamels, and	3-0
	2031	Allied Products	5~8
	2861	Gum and Wood Chemicals	5-8
	2865	Cyclic (coal tar) Crudes, and Cyclic	
		Intermediates, Dyes and Organic Pigments	
		(Lakes and Toners)	6-9
	2869	Industrial Organic Chemicals, not elsewhere	3-9
	2072	listed	
•	2873 2874	Nitrogenous Fertilizers Phosphatic Fertilizers	7-8 7-8
	2875	Fertilizer Mixing Only	5
	2879	Pesticides and Agricultural Chemicals,	•
		Not Elsewhere Listed	5-9
	2891	Adhesives and Sealants	5-8
	2892	Explosives	6-9
	2893	Printing Ink	2-5
	2895	Carbon Black	1-3
	2899	Chemicals and Chemical Preparations, not	3-9
		Elsewhere Listed	3-7
29		PETROLEUM REFINING AND RELATED INDUSTRIES	
	291	Petroleum Refining	8
	295	Paving and Roofing Materials	7
	299	Misc. Products of Petroleum and Coal	7
30		RUBBER AND MISCELLANEOUS PLASTICS PRODUCTS	
	301	Tires and Inner Tubes	6
	302 303	Rubber and Plastic Footwear	6
		Reclaimed Rubber	6 4
	304 306	Rubber and Plastics Hose and Belting Fabricated Rubber Products, not Elsewhere	4
		Classified	4
		1	
31		LEATHER AND LEATHER PRODUCTS	
	311	Leather Tanning and Finishing	8
		(Remaining Three-Digit Codes)	1-3
		•	
32		STONE, CLAY, GLASS, AND CONCRETE PRODUCTS	
	321	Flat Glass	-4
	322	Glass and Glassware, Pressed or Blown	4
	324	Cement, Hydraulic	3
	3274	Line	3
	3291 3292	Abrasive Products Asbestos	3
	3293	Gaskets, Packing, and Sealing Devices	3 3
		"	
33		PRIMARY METAL INDUSTRIES (EXCEPT AS NOTED BELOW)	3
	3312	Blast Furnaces, Steel Works, and	
	222	Rolling and Finishing Hills	6
	333 .	Primary Smelting and Refining of	_
		Nonferrous Metals	7

Step 4 (Continued)

		·	
SIC Number			Mazard Potential
34		FABRICATED METAL PRODUCTS, EXCEPT MACHINERY AND TRANSPORTATION EQUIPMENT (EXCEPT AS NOTED BELOW)	5
	347	Coating, Engraving, and Allied Services	8
	3482		7
	3483		•
		not Elsewhere Classified	7
	3489		
		Classified	7
	349	Misc. Fabricated Metal Products	3-6
35		MACHINERY, EXCEPT ELECTRICAL	5-7
36		ELECTRICAL AND ELECTRONIC MACHINERY, EQUIPMENT	
		AND SUPPLIES (EXCEPT AS NOTED BELOW)	5-7
	3691	Storage Batteries	8
	3692		8
37		TRANSPORTATION EQUIPMENT	5-8
38		MEASURING, ANALYZING, AND CONTROLLING INSTRUMENT PHOTOGRAPHIC, MEDICAL, AND OFFICAL GOODS; WATCHE AND CLOCKS (EXCEPT AS NOTED BELOW)	
	386	Photographic Equipment and Supplies	7
39		MISCELLANEOUS MANUFACTURING INDUSTRIES	3-7
49		ELECTRIC, GAS, AND SANITARY SERVICES	.*
	491	Electric Services	3-5
	492	Gas Production and Distribution	3
	494	Water Supply	•
	4952	Sewerage Systems	2
	4953	Refuse Systems (except Municipal Landfills)	2-5 2-9
	496	Steam Supply	
	70	aceam ambhia	2-4

CONTAMINANT HAZARD POTENTIAL RANKINGS OF WASTES, CLASSIFIED BY TYPE $^{\rm I}$ FOR STEP $^{\rm I}$

•	Description	Initial Rating	I D Numbe
	SOLIDS	1-42	1100
	Ferrous Metals Non-Ferrous Metals	1-72	1200
	Resins, Plastics and Rubbers	2 '	1300
	Wood and Paper Materials (except as noted bel-		1400
	- Bark	4	1401
	Textiles and Related Fibers	2	1500
	Inert Materials (except as noted below)	2	1600
	- Sulfide Mineral-Bearing Mine Tailings	6	1601
	- Slag and other Combustion Residues	. 5	1602
	- Rubble, Construction & Demolition Mixe	d _	./
	Was te	3 ,	1603
	Animal Processing Wastes (Except as noted bel	ow) 2-4 6	1700 1701
	- Processed Skins, Hides and Leathers	4	1702
	- Dairy Wastes - Live Animal Wastes-Raw Manures (Feedlo		1703
	- Composts of Animal Waste	2-4	1704
	+ Dead Animals	5	1705
	Edible Fruit and Vegetable Remains -	2-3	1800
	Putrescables	- ,	
١.	Liquids		
	Organic Chemicals (Must be chemically Classif	ied) ²	2000
	- Aliphatic (Fatty) Acids	3~5	2001
	- Aromatic (Benzene) Acids	7~8	2002
	- Resin Acids	<i>c</i> 7	2003 2004
	- Alcohols	5-7	2004
	- Allphatic Hydrocarbons (Petroleum	4-6	2005
	Derivatives		2006
	 Aromatic Hydrocarbons (Benzene Derivat Sulfonated Hydrocarbons 	7-8	2007
	- Halogenated Hydrocarbons	7-9	2008
	- Alkaloids	7-9	2009
	- Aliphatic Amines and Their Salts	1-4	2010
	- Antilines	6-8	2011
	- Pyridines	2-6	2012
	- PhenoIs	7-9	2013
	- Aldehydes	6-8	2014
	- Ketones	6-8	2015
	- Organic Sulfur Compounds (Sulfides,		
	Mercaptans)	7-9	2016
	- Organometallic Compounds	7-9	2017
	- Cyanides	7-9	2018
	- Thiocyanides	2-6	2019
	- Sterois	1-4	2020
	- Sugars and Cellulose - Esters	6-8	2021
	Inorganic Chemicals (Must be Chemically Class		2022
	- Mineral and Metal Acids	5-8	2100 2101
	- Mineral and Metal Bases	5-8	2102
	- Hetal Salts, Including Heavy Metals	6+9	2102
	- Oxides	5-8	2104
	- Sulfides		2105
	- Juirides	5~8	
		5-8 1+3	
	- Carbon or Graphite Other Chemical Process Wastes Not Previously	1-3	
	- Carbon or Graphite Other Chemical Process Wastes Not Previously (Must be Chemically Classified) ²	I+3 Listed	2106 2200
	- Carbon or Graphite	1+3 Listed 2-5	2106
	- Carbon or Graphite Other Chemical Process Wastes Not Previously ((Must be Chemically Classified) ² - Inks - Dyes	1→3 Listed 2-5 - 3-8	2106 2200 2201 2202
	- Carbon or Graphite Other Chemical Process Wastes Not Previously ((Must be Chemically Classified) ² - Inks - Dyes - Paints	1-3 Listed 2-5 . 3-8 5-8	2106 2200 2201 2202 2203
	- Carbon or Graphite Other Chemical Process Wastes Not Previously ((Must be Chemically Classified) ² - Inks - Dyes - Paints - Adhesives	1-3 Listed 2-5 3-8 5-8 5-8	2106 2200 2201 2202 2203 2204
	- Carbon or Graphite Other Chemical Process Wastes Not Previously ((Must be Chemically Classified) ² - Inks - Dyes - Paints - Adhesives - Pharmaceutical Wastes	1-3 Listed 2-5 3-8 5-8 5-8 6-9	2106 2200 2201 2202 2203 2204 2205
	- Carbon or Graphite Other Chemical Process Wastes Not Previously ((Must be Chemically Classified) ² - Inks - Dyes - Paints - Adhesives - Pharmaceutical Wastes - Petrochemical Wastes	1-3 Listed 2-5 3-8 5-8 5-8 6-9 7-9	2106 2200 2201 2202 2203 2204 2205 2206
	- Carbon or Graphite Other Chemical Process Wastes Not Previously if (Must be Chemically Classified) ² - Inks - Dyes - Paints - Adhesives - Pharmaceutical Wastes - Petrochemical Wastes - Metal Treatment Wastes	1-3 2-5 3-8 5-8 5-8 6-9 7-9 7-9	2106 2200 2201 2202 2203 2204 2205 2206 2207
	- Carbon or Graphite Other Chemical Process Wastes Not Previously ((Must be Chemically Classified) ² - Inks - Dyes - Paints - Adhesives - Pharmaceutical Wastes - Petrochemical Wastes - Metal Treatment Wastes - Solvents	1-3 Listed 2-5 3-8 5-8 5-8 6-9 7-9	2106 2200 2201 2202 2203 2204 2205 2206
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	- Carbon or Graphite Other Chemical Process Wastes Not Previously if (Must be Chemically Classified) ² - Inks - Dyes - Paints - Adhesives - Pharmaceutical Wastes - Petrochemical Wastes - Metal Treatment Wastes - Solvents - Agricultural Chemicals (Pesticides, Herbicides, Fungicides, etc.) - Waxes and Tars - Fermentation and Culture Wastes	1-3 2-5 3-8 5-8 5-8 6-9 7-9 7-9 6-9 7-9 4-7 2-5	2106 2200 2201 2202 2203 2204 2205 2206 2207 2208 2209 2210 2211
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 $^{^{\#}}$ 10 Number is for identification of waste type in the Reporting Form. $^{\circ}$

¹Classification based on material in Environmental Protection Agency Publication, 670-2-75-024, pages 79-85, Prepared by <u>Arthur D. Little, Inc.</u> and published in 1975.

 $^{^2\}mbox{For individual material ranking refer to solubility-toxicity tables prepared by Versar, Inc. for the Environmental Protection Agency.$

Step 4. (Continued)

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Step 4 confidence rating for waste character.

Rating	Basis for Determination of Rating
A	Waste character rating based on specific
	waste type.
В	Waste character rating based on SIC category.

Step 4. Overall Groundwater Contamination Potential

Step 5 Rating = Step 1 + Step 2 + Step 3 + Step 4

Step 6. Rating the Potential Endangerment to a Water Supply

Case A -	1600 meter	lority: Rate to s of the site to of waste plume of	hat is in the a	
Case B -	rate the c	ority: If there is in the antic ment.	water within 16	00 meters of th
Case C -	satisfying supply well of the site	rity: If no su Case A or B ex 1 or surface wa e that is not in e movement.	ists, rate the ter supply with	closest water In 1600 meters
Case D - Select the ap	wells with rate the s	ority: If there in 1600 meters ite as "OD." ting for the gi	of the site in	any direction,
	wells with rate the s	in 1600 meters ite as "OD."	of the site in	any direction,
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Select the applications of the select the applications of the select the sele	wells with rate the sopropriate rate Case A	in 1600 meters ite as "OD." ting for the gi Case B 88	of the site in ven distance an Case C	d case:

Step 6 confidence rating for determination of the anticipated direction of waste plume movement.

Rating	Basis for Determination of Rating
A	Accurate measurements of elevations of
	static water levels in wells, springs, swamps,
	and permanent streams in the area immediately
	surrounding the site in question.
	Ground-water table maps from published State
	and Federal reports.
В	Estimate of flow direction from topographic maps
	in non cavernous area having
	permanent streams and humid climate.
	Estimate of flow direction from topographic maps
	in arid regions of low relief containing some
	permanent streams.
C	Estimate of flow direction from topographic
	maps in cavernous, predominantly limestone
	areas (karst terrain).
	Estimate of flow direction from topographic
	maps in arid regions of highly irregular
	topography having no permanent surface
	streams.

Step 7. Confidence Ratings Have Been Presented With Each Step

STEP 8

MISCELLANEOUS IDENTIFIERS

This step allows the evaluator to identify any additional significant variable not noted in the rating system. Such parameters are:

Identifier

- R The site is located in a ground-water recharge area,
- D The site is located in a ground-water discharge area,
- The site is located in a flood plain and is susceptable to flood hazard,
- E The site is located in an earthquake prone area,
- The site is located in the area of influence of a pumping water supply well,
- K The site is located in karst topography or fractured, cavernous limestone region.
- C The ground water under the site has been contaminated by man-made causes (i.e., road salt, feed lot, industrial waste).
- M Known ground-water mound exists beneath the site.
- Interceptor wells or other method employed to inhibit contaminated ground-water migration (endangerment to water supply wells may be reduced).

APPENDIX B

A LISTING OF THE ASSESSMENTS

SUPPLIEF IMPROMPMENT ASSESSMENT (STAT

LOCATION OF ASSESSMENTA* LATITUME 38014mies LOUGITUME 1120398585 STATE TO NO. DYESSA OPF PATOR= OWNERS BEAVER CITY HEAVER CITY 60 KEST CENTER 60 WEST CFHIER SEAVER CITY BEAVER CITY UT 44713 UT #4713 **F4EILITY IDENTIFICATION NPDES NO. CHTY/CTTY PLACE CATEGORY SIA SITE NO. IMPNDMNTS STC CODE HEAVER 490021732 4952 HEAVER ** OPFRATIONAL FEATURES OF IMPOUNDMENTS ** LAST YP. SURFACE AREA TOTAL SURFACE IMP. INFLOW VR.OF RECORD THP. NO. PHEPOSE 4 G f IN HSF AREA (ACRES) IN OP. (ACRES) (GALL/DAY) 47.72 1979 YFS 250000 PETMANY 10.87 PHIMARY YFS 47.72 8.47 . 2 PRIMARY YES 10.50 47,72 9 0 PRIMARY YF5 17.88 47.72 INP. FFFLUENT YR. OF FOTAL AVE. INFLOW YR.OF TOTAL AVE. EFF. LINER TYPE THICKNESS LIVESTOCK LIVESTOCK (GALL /DAY) RECORD (GALL/DAY) HECORD (GALL/DAY) (INCHES) NUMBER TYPE 250000 NONE 250000 NONE 250000 NONE 1979 250000 NONE **GROUNDWATER CONTAMINATION POTENTIAL ** **GROUNDWATER MONITORING** OVERALL ON HEALTH WAST GW CHANGES DRINK WATER + LINST WAST HIRD GROUNDHATER G# GLT WELLS SAMPLE FREG FROM ANAL. QUAL CHANGS ** PTNG&CON RATING CON RATING CON RATING CON CONTAM POT HZRD CON ID NO ** 90 2301 NONE HNKN 3 A 4 5 21 48 D 2301 UNKA ** 9C 34 21 48 MUNE 2301 Ð 0 NONE ** 90 34 21 48 21 2301 NONF DAKA ** 90 48 SURFACE IMPOUNDMENT ASSESSMENT (SIA) **LOCATION OF ASSESSMENT** LATITUDE D H S LONGITUDE STATE ID NO. UTD073 OPFP4TOR# OWNERE ALTAMONT ALTAMONT ALTAMONT ALTAMONT UT 84001 UT EARRY **FACILITY IDENTIFICATION** PLACE CATEGORY STA SITE NO. IMPNOMNTS NPDES NO. SIC CODE **CNTY/CTTY** 190150091 4952 DUCHE SNE TURNATIA **OPERATIONAL FEATURES OF IMPOUNDMENTS** YE OF RECORD SURFACE APEA TOTAL SURFACE THE TRELOW YES OFFE LAST YP. IN USE AGE AREA (ACHFS) (GALL/DAY) IN IP. (ACRES) 1973 1.54 3.00 50000 n SECOUPARY YFS 3,04 O YFS 0,82 SECOMBARY 3.04 0.68 SEPTINDARY YFS LINER TYPE THICKNESS LIVESTOE LIVESTOCK IMPOPPELIENT YOUR TOTAL AVE. INFIRM YEAR TOTAL AVE. FFF. (INCHES) NUMBER TYPE (GALL/DAY) (GALL/DAY) BECORU (GALL/DAY) PECORO 0 20000 0 NONE 20000 0 NONE

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UT 84301 **FACILITY IDENTIFICATION**

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ŏ		NOI						YES		5c	7	30	7	Š	ī	4	F		17	48	8		2301
ă		NO						YE8		SC	7	3č		É	- A	4		a	17	48	Ā		2301
Ä		NO						YFS		50	Ã	30	Ā	ě	Ä	ű.	ì		17	48	8		2301
ŏ		NO	-					YES		5C	- 7	3C	- 7	2	~	<u>,</u>			17	48	Ã		2301
		Nill						YES		50		30	•	2	7	, , , , , , , , , , , , , , , , , , ,			17	un.	~		2301
U		14111	N P					15 2		30		3 L	-	7	_	-	,	•	1,	- 0			F 20 I

SUFFACE IMPOUNDMENT ASSESSMENT (STAT

4952

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GROUNDWATER CONTAMINATION POTENTIAL

HAST HERD OVERALL GH HEALTH

23

23

YR.OF RECORD

1973

1979

HIRD CON 10

48

48

LIVESTOCK

HAST

ID NO

2301

2301

***** **LOCATION OF ASSESSMENT## STATE TO MAN. UTSASI LATITUDE BODSONIOS LONGITUDE 109026MIRS OWNERS OPERATORS DETCH JOHN DUTCH JOHN PO 50x 278 PO 80x 278 DUTCH JOHN OUTCH JOHN UT 84023 UT 84023 **FACILITY IDENTIFICATION** CNTY/CITY PLACE CATEGORY SIA SITE NO. IMPNOMNTS NPOES NO. SIC CODE DAGGET 490021121 **OPERATIONAL FEATURES OF IMPOUNDMENTS** IPP. NO. PUPPOSE AGF IN USE YRS OPEN LAST YR. SURFACE AREA TOTAL SUNFACE IMP. INFLOW (YR) IN OP. (ACRES) AREA (ACRES) (GALL/DAY) 21 9,03 15000 SECONDARY YES 0 4.92 4.11 9,03 SECONDARY 21 YES 21 TOTAL AVE. INFLOW YP.OF TOTAL AVE. EFF. IMP.EFFLUENT YR.OF LINER TYPE THICKNESS LIVESTOCK (GALL/DAY) PECORD (BALL/DAY) RECORD (GALL/DAY) (INCHES) NUMBER

1979

1979

UNKN ** 98 A 54

** 98

GH AVL

54

FROM ANAL. QUAL CHANGS**RINGSCON RATING CON RATING CON CONTAN POT

A

GH GLT

A

5

15000

15000

UNKN

1979

1979

GROUNDWATER MONITORING NO. GROUNDWATER GW CHANGES DRINK WATER+#UNST

WELLS SAMPLE FREQ

NONE

NONE

SURFACE IMPOUNDMENT ASSESSMENT (SIA) *******************

LOCATION OF ASSESSMENT
LATITUDE 39027M385 LONGITUDE 113055M2 S STATE ID NO. UT,1113 OWNERS

CHMPAIN

GENERAL DELIVERY

EPHRAIM OPERATOR# EPHRAIF GENERAL DELIVERY EPHRAIM

UT 84627 UT 84627 **FACILITY IDENTIFICATION**

		TY/CITY PETF	PLACE EPHRAI4	MUN	RY SIA SIT STIONAL FEA	11	6	NPDES NO. 490020079 ***	81C CODE 4952
IMP. NO.	PHPPOSE	AGF	IN USE	YRS DPEN	LAST YR.	BURFACE	AREA TOT	AL SURFACE	IMP. INFLOR

(YR) IN UP. (ACRES) AREA (ACRES) (GALL/DAY) 1 SECONDARY A YES B 0 24.21 49.57 500000 1973 2 SECONDARY A YES B 0 4.99 49.57 0 0 3 SECONDARY B YES B 0 5.83 49.57 0 0 4 SECONDARY B YES B 0 4.90 49.57 0 0 5 SECONDARY B YES B 0 4.87 49.57 0 0 6 SECONDARY B YES B 0 4.77 49.57 0 0	IMP. N	O. PHPPOSE	AGF	IN USE	YRS DPEN	LAST YR.	BURFACE AREA	TOTAL SURFACE	IMP. INFLOW	YR.OF RECO	R
2 SECONDARY A YES 8 0 4.99 49.57 0 0 3 5 5 6 3 49.57 0 0 0 4 5 5 6 3 49.57 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			(4K)			IN UP.	(ACRES)	AREA (ACRES)	(GALL/DAY)		
3 SECONDARY B YES 8 0 5.83 49.57 0 0 0 4 5 5 6 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	1	SECONDARY	A	YFS	8	a	24.21	49.57	500000	1973	
Û SECONDARY 8 YES 8 0 Û, 90 Û9,57 0 0 5 SECONDARY 8 YES 8 0 4,87 49,57 0 0	5	SECONDARY	Ą	YE S	8	n	4.90	49.57	0	G	
S SECONDARY 8 YES 8 0 4 87 49.57 0 0	3	SECONDARY	8	YE 8	8	0	5,83	49.57	0	0	
The state of the s	4	SECONDARY	8 '	YES	8	0	4.90	49.57	0	0	
6 SECONDARY 8 YES 8 0 4.77 49.57 0 0	5	SECONDARY	8	YE8	8	0	4.87	49.57	0	0	
	b	SECONDARY	8	YES	8	0	4.77	49.57	ñ	0	

IMP.EFFLUENT	YW.OF	TOTAL AVE. INFLOR	YR.OF	TOTAL AVE. EFF.	LINER TYPE	THICKNESS	LIVESTOCK	LIVESTOCK
(GALL/DAY)	RECORD	(GALL/DAY)	RECORD	(GALL/DAY)		(INCHFS)	NUMBER	TYPE
0	O	500000197	0	0	NONE	0		
Ð	0	500000197	0	0	NONE	0		
0	9	500000197	0	0	NONE	0		
O	ņ	500000197	p	0	NONE	4)		
0	0	500000197	٥	0	NONE	0		
O	0	500000197	0	O O	NONE	0		

	0	0	500000197		D	0			NONE		0			
	**GROUNDWAT	FR MONITORIA	G * *					**GR0	UNDWATER	CONT	AMINATION P	OTENTIAL*	*	
NO.	GPOUNDWATER	GH CHANGES	DRINK HATE	R##UNST	GW AVL		GW OLT		WAST HZR	D	OVERALL GH	HEALTH	MISC	HAST
MELLS	SAMPLE PRPD	FROM ANAL.	QUAL CHANG	S**PTNG&C	ON PATING	CON	RATING		RATING	CON	CONTAM POT	HZRD C	ON ID	ID NO
0	NONF		UNKN	** 4C	A 3C	A	5	A	4	A	16	5 A	8	2301
0	NONE		UNKN	** 40	A .3C	A	5	A	4	A	16	54	b	5301
0	NONE		UNKN	** 4C	30	A	5	A	4	A	16	54	ə	2301
0	NONE		UNKN	** #C .	4 3C	A	5	A	4	A	16	5 A	8	2301
0	NONE		UNKN	** 40	4 3C	A	5	4	4	A	16	5 A	В	2301
0	NONE		UNKN	** 45	4 3C	A	5	A	4	A	16	5 A	8	2301

SEPPACE INFOUNDMENT ASSESSMENT (SIA)

STATE ID HO. UTG064 OWNERS **GRANTSVILLE**

. . LOCATION OF ASSESSMENTER [ATTTORE 400378938 LONGTIME 1120278158 NOTE WATTER

MARTSVILLE 7 PARK STREET

7 PARK STREET GRANTSVILLE GRAMISVILLE UT 84029 UT 64129 **F#CILITY TOLATIFICATION* PLACE CATEGURY SIA SITE 10. IMPINENTS MPDES THE SIC CODE CHTY/CITY 15 490021130 1945 TOOFLE GRANTSVILLE ** TPERATIONAL FEATURES OF IMPRUNOMENTS** IMP. NO. PURPOSE IN USE YRS OPEN LAST YE. SURFACE AREA TOTAL SURFACE IMP. INFLOW 14 UP. (ACHES) ANFA (ACHES) (GALL/OA)) (YP) 345000 SECONDARY ø YF 5 n 2.44 49.40 1475 SECONDARY YFS 2.40 49.00 7 40 49,00 n SECONDARY YES . n SECONDARY YES A, AA 49,00 49,00 SECONDARY YE8 ٨ 6.80 49.00 SECONDARY YES 6.17 ۵ 49 00 SECUNDARY YES 6.19 7.00 49,79 SECONDARY YES IMP_EFFLUENT YR_OF TOTAL AVE. INFLOW YF.OF TOTAL AVE. EFF. LINER TYPE THICKNESS LIVESTOCK LIVESTOCK RECOPD (GALL/DAY) (GALL/DAY) RECORD (GALL/DAY) (INCHES) # 19MUH LYPE 385000 1973 365197 197 AACH \$85000 NONE NONE 385000 385000 NIBNE 385000 NONE 385000 NONE 385000 Δ NONE 385000 **GROUNDWATER MONITORING** **GROWNOWATER CONTAMINATION POTENTIAL** WAST HERD UVERALL GA HEALTH "15C GROUNDWATER GW CHANGES DRINK WATER + BUNST GW AVL FPOM ANAL. GUAL CHANGS++RTNG&CON PATING CON KATTING CON RATING CON CUNTAM FOT 10 NONE UNKN 4# 94 5 4 64 A

~4ST WELLS SAMPLE FRED 10 NO 2301 NUNE UNKN 10 2301 NONE 44 44 24 1 C 2301 UNKE HONE Á 20 10 23.11 2501 NONE UNKN -- 44 4 24 10 64 24 2501 NUNE UNKN ## 9A 10 24 10 2301 NONE UNKN ** 94 64 24 10 2391 NINE UJKN ** 91 64

SUPFACE IMPOUNDMENT ASSESSMENT (SIA) *****************

STATE ID NO. UTKO43 OHNERS

HENEFER

UT 84033

LOCATION OF ASSESSMENT

LATITUDE 41001M328 LONGITUDE 111030H098

HENEFER PO BOX 112

HENEFFR PO 40x 112 HENEFER UY 84433

FACILITY IDENTIFICATION
CATEGORY SIA SITE NO. IMPNOMNIS CHTY/CITY PLACE NPDES NO. SIC CODE SUMMIT HENEFER MUN 16 3 4900 **OPERATTONAL FEATURES OF THPOUNDMENTS** 490020192 4952

IMP. NO	0 016	RPOSF	AGE	IN USE	YRS OPEN	LAST YP_	SURFACE AREA	TUTAL SURFACE	IMP. INFLOW	YR OF RECORD
****** ***	v _e PV	nrvar	(4A)	14 136	ING UPEN	IN OP.	(ACHES)	AREA (ACPES)	(GALL/EAY)	IN OF MELOND
		_	£ 4 m 1			Che Ch.			faurthen 1)	
1	SECON	DARY	0	YES	Đ	()	2.86	11.84	900	1973
2	SECON	DARY	0	YES	Λ	9	5.34	11,84	n	û
3	SECON	DARY	0	YES	n	0	3.64	11.84	ŋ	U
IMP.EF	FLUENT	YR.OF	TOTAL	AVE. INFL	OW YR.OF	TOTAL AVE	. EFF. ITNE	R TYPE THICKNES	S LIVESTOCK	£ Iveslock
(GALL/		RECORD		LL/DAY)	RECORD			CINCHES		TYPE
	0	0		600	Ú		n	NUFE 9		
	0	ð		690	9		3 .	NONE 3		
	0	1973		600	0		n	NONE U		
**G	ROUNDHA	TER MON	ITORING				**GR0	UNDHATER CONTAMI	NATION POTENTIA	L++
	DWATER			DRINK WATER	***UNST	GN AVL	GH GLT	HAST HEND OVE	HALL GH HEALTH	MISC MAS
S SAMPLE	E FREU	FROM	ANAL.	BUAL CHANGS	**RTNG&CON	RATING CO	W RATING CON	RATING FON COM	TAM POT HZRD	cos 16 16

NO. AST MELL 10 NU 2301 0 NONE 48 NONE YES 2301 NONE 2301

SUPPACE IMPOUNDMENT ASSESSMENT (SIA)

YF. OF RELUED

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n

LIVESTOCK

TYPE

LOCATION OF ASSESSMENT ** STATE TO NO. UTM114 LATITUDE D h S LONGITUDE OWNERE DOFFATORE HUNTINGTON HUNT THE TON CITY HALL HUNTINGTON CITY HALL HUNTINGTON UT 84528 UT 64528 **FACILITY IDENTIFICATION CHTY/CITY PLACE CATEGORY SIA SITE NU. IMPUDMNTS NPDES NO. SIC CODE EMERY HUNTINGTON 17 400051206 4452 **OPERATIONAL FEATURES OF IMPOUNDMENTS** LAST YN. IMP. NO. PURPUSE AGE IN USE SURFACE AREA TOTAL SURFACE IMP. INFLUM AREA (ACPES) (ACRES) (YR) IN UP. (GALL/DAY) 16.10 34.60 DI SPO 0.00 34,80 #ST YES **FST** DI SPO YES 0.00 34.80 HST DI SPO YES n, nu 34.80 HST DI SPO YES 0,00 WST DI SPO YES. 0,00 34.80 IMP.EFFLUENT (GALL/DAY) TOTAL AVE. INFLUM YH. DF LINER TYPE LIVESTOCK TOTAL AVE. EFF. THICKNESS RECORD RECORD (GALL/DAY) (GALL/DAY) (INCHES) NUMBER NONE NONE NONE

NONE NONE **GROUNDWATER CONTAMINATION POTENTIAL** **GROUNDWATER MONITORING** GROUNDWATER GW CHANGES DRINK WATER + MINST GW AVL GM OLY WAST HZRD DVERALL GW HEALTH MISC WAST WELLS SAMPLE FREQ FROM ANAL. QUAL CHANGS ** RING&CON MATING CON RATING CON RATING CON CONTAM POT HZHD 10 LO NO HONE YES 44 90 5 A 2301 55 68 NUNE ** 90 5A YES 1065 NONE YES .. 90 54 đ 22 66 2301 NONE YES ## 9C 54 22 2301 4 a 66 NONE YES 39 ** 54 55 bb 1015 ** 90 NONE YFS 54 55 68 2301

NONE

SURFACE [MPHHAD"ERT ASSESSMENT (SIA) ******************

STATE ID NO. UTKOOS OWNER

LOCATION OF ASSESSMENT LATITUDE D H S LONGITUDE

COLOATORS

HAMAS CITY

*AMAS CITY

	AMAS		Γ¥										MAS CI 1 84036								
										**FACI	LITY 1	DENTIF	TCATTO	N * *							
					CHTY/CTT	y P	LACF		ATEG	DRY ST	A SITE	110.	IMPNOM	NTS	NPUES	NO.	8	SIC CODE			,
					SUMMIT	KAHAS			*: HIN		19	7	5		490050	1960		4952			
								4	*OPE	RATIONAL	L FEAT	TUFFS (DE IMPO	UNDMENT	S = *						
	IMP.	NO,	. PU	RPOSE	AGE (YH)	IN US	E	YRS E	H'EN	LAST IN OP.		SURF AC	E AREA		SUPF A			INFLOW	Y6.0	F HECO	кit
		1	PRIMA	RY	5	YE8		9	,	6			48		16.07			5000	19	73	
		Ž	PRIMA		Š	YES		Ġ		ň			35		16.07			5000		73	
			PRIMA		É	YES		á		A			A8		16.07		-	ú	•	9	
		4	PRIMA		Š	YES		Ġ		a			88		16.07			0		0	
		5	PRIMA		5	YES		5	i	e			46	•	16.07			6		0	
	IMP.	EFFL	UENT	YR.O	F TOT	AL AVE.	INFLU	M 46	. OF	TOTAL	AVE.	EFF.	I, LME	R TYPE	THICK	CNESS	L	LVESTOCK	114	ESTOCK	
	(GAL	L/D/	(Y)	PECO	PD (1	GALL/DAY)	₽F	COPO	(GAL	LIDAY)			(180	HES)	1	MHFEH		TYPE	
			0	-	0	11000	n		e		71000			NONE		ü					
			0		D	11000	0		0		7100					n					
			0		0	11000	0		6		71000			NONE		U					
			9		9	11000	n		6		71000			HONE		(r					
		710	000	197	3	11000	0		ត		71000			NONE		1,3					
		+GR(DUNDHA	TER M	ONITORIN	G##							**690	UNDWATE	F COLT	[AMINA	TIUN	PUTENTIA	L * *		
NO.	GRO	UND	MATER	GH (CHANGES .	DRINK H	ATER+	*UNS1		GW AVL		GW WL	.1	WASE HZ	PD	OVERA	LL Gr	r HEALTH		MISC	*AST
WELLS	SAM	PLE	FREG	FRO	4 ANAL.	OUAL CH	ANGS+	*RTNG	&CON	PATING	CON	HATE	46 CON	RATING	COM	CONTA	M P01	T HZRD	€ ÚN	10	TO NO
Q		NO	VE.			UNK	N #	* SC	A	5A	A	5	A	4		1	9	54	٠		2301
0		K01	VE.			UNŘ	i ±	• 50	A	5 A	Δ	5	4	4	A	1	9	5 A	ь		2301
0		NO	٧E			UNK	N +	* 5C	A	5 A	A	5	A	4	A	1	9	54	۳		5301
0		NO	٧E			UNK	N m	* 5C	A	54	A	5	A	4	Ą	1	9	54	*		2301
0		NO	4E			UNK	N +	* 50	A	5A	A	٩.	A	4	A	1	9	54	н		2301

SHREACE IMPOUNDMENT ASSESSMENT (SIA)

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						* *	****	***	***	***	****	* * *						
				**[TEATION OF	ASSFSS	MENT*	•										
STATI	F 10 80			4 1	ATTTUDE	Ð Þ	5 (ONGITUD	F	D >	S							
OWNER	k æ									OPERATO	Pa							
	LAPK HE	NNECOT	T COPPER	COMMO	RATION					LAR	K SEWF	HAND	MATER ASSO	CIATION	l .			
			DELIVERY							158	MAIN							
	ARK	- '								LAR	K							
i	ur Bara	n								DT	84040							
								**FACIL	I VII	DENTIFE	CATION	**						
			C+	TYZETT	/ PLA	CE	CATEG	TRY SIA	SITE	#10. I	MPNDM	ITS	NPDFS NO.	. 51	C CODE			
			SALT	LAKE	LARK		MUN		21		5		900222684	ŭ	952			
				-	-		**OPE	PATIONAL	FEAT	URFS OF	IMPOL	INDMENT	S**					
		_							_			****	6055166			NC 51		
	IMP. N	U. P	HEPOSE	AGF	IN USE	445	DPEK	LAST Y	H .				SURFACE	IMP. I		TH.UP	RECO	***
				(Ab)		_		TN OP.		(ACRES		AREA	(ACRES)	(GALL/0				
	1	PRTH		50	YES	5		n		0.0			2.00		000	197		
	5	PRIM		56	YES	5		0		5.0			5,00		000	191		
	3	DEIN		56	YES	?		0		5.0			3.00		000	197		
	4	PPTM		50	YES	5		0		0,0			2.00		000	197		
	5	PRTH	ARY	56	YES	5	6	0		0,0	+a		5.00	٤:	000	197	74	
	IMP.FF	FLUENT	YP.OF	TOT	AL AVE. I	FLOW Y	R.OF	TOTAL	AVE.	EFF.	LINER	TYPE	THICKNESS	LIV	ESTOCK	LIVE	STOCK	
	(GALL/		PECORE		SALL/DAY)		ECCAD	(GALL	/DAY)	-	•		(INCHES)	N.	MBER	1	TYPE	
		0	1979	•	100000		1979		Ò			LAY	Û					
		ō	1979		100000		1979		0			LAY	0					
		0	1979		100000		1979		0			LAY	0					
		0	1979		100000		1979		0			LAY	0					
		0	1979		100000		1979		0		Ċ	LAY	0					
	G	ROUNDW	ATER HOP	ITORIN	3 * *						**GROU	INDWATE	R CONTAMIN	MATTON P	OTENTIA	L		
NO.	GRUUN	DHATER	GH CH	ANGES	DRINK WAT	ER##UNS	T	GH AVL		GH GLT		SH TEAL	RD GYER	ALL Gh	HEALTH	1	MISC	TEAM
WELLE	S SAMPL	E FRFQ	FROM	ANAL,	QUAL CHAN	GS++RTN	G&CC*	RATING	CON	RATING	CON	RATING	CON CONT	TOQ MA	HZRD	CON	10	ID N
0	Mo	NTHLY	NO)	NO	** 0E	Ä	40	A	5	A	4	8	13	OD	В		2301
0	HO	NTHLY	NO)	NO	** BE	A	40	A	5	A	4	8	13	OD	8 -		2301
0	мо	NTHLY	NE)	NO	** 0E	A	46	À	5	A	4	Ĥ	13	QQ	8		2301
0	мо	NTHLY	N()	NO	** 0E	A	4C	A	5	A	4	Ú	13	. 00	ê		2301
0	MO	NTHLY	M()	NO	** 9E	A	40	A	5	A	4	B	13	00	¥		2301

SURFACE IMPOUNDMENT ASSESSMENT (SIA)

LOCATION OF ASSESSMENT

STATE ID DU. DITO1? LATITUDE 41034M47S LONGITUDE 111051M37S

OPERATORS

LUGAN CITY CORPORATION
61 MEST 100 NORTH
LUGAN
UT 84321

LUGAN
UT 84321

FACILITY IDENTIFICATION

CHTY/CITY PLACE CATEGORY SIA SITE NO. IMPNOMMTS HEDES NO. SIC CODE

CACHE LOGAN MUN 23 490021920 4952

OPERATIONAL FEATURES OF IMPOUNDMENTS

IMP. NO.		PURP	OSF	AGF	IN USE	VRS OFER	LAST YR.	SURFACE AREA	TOTAL SUPFACE	IMP. INFLOW	YR.OF HECORD
				(Ab)			IN OP.	(ACRES)	AREA (ACRES)	(GALL/DAY)	
1	#ST	51	OWA	11	YES	11	0	10,51	51,45	10300000	1976
2	WST	ST	DRA	11	YES	11	0	7.84	51.45	0	O .
3	WST	51	OPA	11	YES	11	0	10.50	51.45	0	0
4	WST	ST	OPA	11	YES	11	0	7,49	51,45	0	0
5	WST	8 T	OPA	11	YFS	11	ń	7,12	51,45	0	Ó
6	WST	\$ 1	OPA	11	YFS	11	0	4.36	51,45	0	0
7	+ST	ST	0 × 4	5 3	YES	11	n	3.13	51.45	0	0

IMP.EFFLUENT (GALL/DAY)	YR.OF RECORD	TOTAL AVE. INFLOW (GALL/DAY)	YP.OF RECORD	TOTAL AVE. EFF. (GALL/DAY)	LINER TYPE	THICKNESS (INCHES)	LIVESTOCK NUMBER	LIVESTOCK TYPE
0	n	10300000	0	1100000	NONE	6)		
e	a	10300000	0	1100000	HONE	U		
n	0	10300000	d	1100000	NONE	0		
0	0	10300000	0	1100000	NONE	U		
0	n	10300000	0	1100000	NONE	0		
0	0	10300000	0	1100000	NONE	0		
1100000	1976	10300000	0	1100000	NONE	0		

GROUNDWATER MONITORING **GROUNDWATER CONTAMINATION POTENTIAL ** NO. GROUNDHATER GH CHANGES DRINK HATERHAUNST GH ULT WAST HEAD OVERALL ON HEALTH Gn AVL MISC WAST HELLS SAMPLE FRED FROM ANAL. GUAL CHANGS ** PTNG&CON RATING PATING CUN CONTAM POT PATING CON HZRD CON 10 ID NO NAME UNKN ** SC EU 54 19 54 B 1022 NONE ** 50 ED 0 UNKN 54 19 54 ₿ 2301 UNKN ** 50 MONE 19 £ρ 2301 0 54 54 8 . NONE UNKN ** 50 54 ь 2301 19 ΕĐ NONE LINKY ** 50 54 19 54 B ED 2301 Δ A NONF UNKN ** 50 19 54 5 ED 2301 Δ 5 A 4 NONE ** 5C 2301

SHRFACE IMPOUNDMENT ASSESSMENT (SIA)

LOCATION OF ASSESSMENTER STATE TO NO. UTT 64 LATITUDE 490370-235 | LONGITUDE 111055M058 DWAFPE PIRVALE CITY CORPORATION MIDVALE CITY CORFUEATION PO POX 248 PO 80x 248 MIDVALE MIDVALE UT 84047 UT 84647 **FACILITY IDENTIFICATION CHTY/CTTY PLACE CATEGORY SIA SITE NO. IMPNOMNTS NPLES NO. SIC CODE 490020281 4952 SALT LAKE MICVALF 24 7. Ma-N **OPFRATIONAL FEATURES OF IMPOUNDMENTS** SURFACE AREA TOTAL SURFACE YR.OF RECORD IHP. NO. PURPOSE **AG**€ IN USF YPS OPEN LAST YR. IMP. INFLOW IN OP. AREA (ACRES) (GALL/DAY) (AB) (ACRES) 48,00 SECONDARY 2 VE S ۸ 16.00 497000 197 48,00 200497000 197 SECONDARY YES n 16.00 200497000 SECONDARY YFS 16,00 48.00 197 IMP. FFFLUENT YR. OF FOTAL AVE. INFLOW YE.OF TOTAL AVE. EFF. LINER TYPE THICKNESS LIVESTOCK LIVESTOCK RECORD (INCHES) (GALL/DAY) (GALL/DAY) RFCOHD (GALL/DAY) AUMBER TYPE 0 6830000 197 6340000 200 6830000 197 6340000 200 6830000 197 6340000 200 **GROUNDWATER MONITORING** **GROUNDWATER CONTAMINATION POTENTIAL ** GROUNDHATER GH CHANGES DRINK WATER ** UNST WAST HERD OVERALL ON HEALTH GW AVL GW OLT WAST WELLS SAMPLE FRED FROM ANAL, QUAL CHANGS ** PTNGECON RATING CON RATING CON RATING CON CONTAM POT ID NO HZRO 10 MANA UNKY ++ 75 A 5 F 19 2301 Ð 34 A 4 4 68 ы ΕD £D 2301 68 UNKN ** 70 34 В 19 û MONE 10 ED 2301 68 ** 75 14 ٥ NONE HINK SUPFACE IMPOUNDMENT ASSESSMENT (SIA) ##LOCATION OF ASSESSMENT## STATE ID NO. UTDISE LATITUDE 38023M135 LONGITUDE 113000M308 ONNERS OPERATOR= MILFORD MILFORD 55 WEST 400 SOUTH 55 WEST 400 SOUTH MILFORD MILFORD UT 84751 UT 84751 **FACILITY IDENTIFICATION** CHTY/CITY PLACE CATEGORY SIA SITE NO. IMPNOMNTS NPDFS NO. SIC CODE 490020176 4952 BEAVER MILFORD **OPERATIONAL FEATURES OF IMPOUNDMENTS** YR.OF RECORD SURFACE AREA TOTAL SURFACE IMP. INFLOR IMP. NO. PUPPOSF AGF IN USE YRS CPEN LAST YR. (YP) (ACRES) AREA (ACHES) (GALL/DAY) IN OP. 1973 PPTHARY ٥ Ω 7.94 34,46 490000 PRIMARY 0 YF S 6 n 7.94 34.46 0 0 PRIMARY YES 6 ŋ 8,53 34,46 IMP . EFFLUENT YR. OF TOTAL AVE. INFLOW YR.OF TOTAL AVE. EFF. LINER TYPE THICKNESS LIVESTOCK LIVESTOCK (GALL/DAY) RECOPD (GALL/DAY) FELORD (GALL/DAY) (TNCHFS) NUMBER TYPE 490000 a 11 0 0 490000 CLAY 43 490000

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**GROUNDWATER CONTAMINATION POTENTIAL **

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GPOUNDWATER OF CHANGES OF I'M WATER # LINST

SUPPACE IMPOUNDMENT ASSESSMENT (SIA)

LOCATION OF ASSESSMENT

YES

** 6C

NONE

STATE ID NO. UTJ044 LATITUDE DE S LONGTTURE OPERATOR: OWNERE HORGAN CITY MORGAN CITY 48 WEST YOUNG STREET 48 WEST YOUNG STREET MOFGAN CITY HORGAN CITY UT 84050 UT 64050 **FACILITY IDENTIFICATION** CHTY/CITY PLACE CATEGORY SIA SITE NO. IMPNOMNTS NPOFS NO. SIC CODE MORGAN 26 4952 **OPERATIONAL FEATURES OF IMPOUNDMENTS** SURFACE ARFA TOTAL SURFACE IMP. INFLOW YR.OF RECORD IMP. NO. PURPOSE AGE IN USF LAST YP. AREA (ACRES) IN OP. (ACRES) (GALL/DAY) (YR) 20.34 SECONDARY YES ø 7.04 20.34 SECONDARY YES 2.98 a SECONDARY YES 3.00 20.34 SECONDARY YES 3.47 20.34 0 n SECONDARY YES 3.85 20.34 LIVESTOCK TOTAL AVE. INFLOW YR. OF TOTAL AVE. EFF. LINER TYPE THICKNESS LIVESTOCK IMP. FFFLUENT YP. QF (GALL/DAY) RECORD (GALL/DAY) RECORD (GALL/DAY) (INCHES) NUMBER TYPE 200000 NONE 200000 NONE 200000 NONE 200000 MONE 200000 NONE **GROUNDWATER CONTAMINATION POTENTIAL** **GROUNDWATER MONITORING** GROUNDWATER GW CHANGES DRINK WATER++UNST GW AVL GW OLT WAST HIRD OVERALL GN HEALTH HZRD CON RATING CON RATING CON CONTAM POT ID ID NO WELLS SAMPLE FRED FROM ANAL. QUAL CHANGS**RINGSCON RATING CON-YFS ** 6C A 5 48 1022 NONE 3A 18 A 48 D 2301 18 HONF YE \$ ** 60 34 0 NONE YES ** 60 34 5 18 48 D 2301 NONE YES ** 60 3 4 18 48 8 0 2301 0 A

SURFACE IMPOUNDMENT ASSESSMENT (SIA) **LOCATION OF ASSESSMENT**

LATITUDE D M S LONGTTUDE STATE ID NO. UTKO62 D M S OPERATOP= OWNERS

TOWN OF DAKLEY

TOWN OF DAKLEY

DAKLEY

DAKLEY

i	T 84055							UT 84055				
				CNTY/CITY BUMMIT	PLACF	CATEG:	ORY SIA SIT	IDENTIFICATION E NO. IMPNDMN		81C CODE		
				JUN 1	STATE !			TURES OF IMPOU		4 - 4		
	IMP. NO	. PL	RPOSE	AGE	IN USE	YPS OPEN	LAST YR.	SURFACE AREA	TOTAL SURFACE	IMP. INFLOW	YR.OF RECOR	D
				(YR)			IN OP.	(ACRES)	AREA (ACRES)	(GALL/DAY)		
	1	SECON	DARY	А	YES	7	n	2,50	6,48	32000	1976	
	2	SECON	DARY	0	YF 8	0	o.	0.89	6.48	0	0	
	3	SECON	DARY	0	YE &	0	0	0.90	6.48	0	0	
	4	SECON		0	YEB	٥	. 0	0.73	6,48	0	0	
	5	SECOF	DARY	n	YES	0	0	0,73	6.48	0	0	
	6	SECON		ß	YES	0	0	0.73	6.48	0	0	
	IHP.EFF	LUENT	YP.0	F TOTA	L AVE. INFLO	W YR.OF	TOTAL AVE.	EFF. LINER	TYPE THICKNESS	LIVESTOCK	LIVESTOCK	
	(GALL/D	AY)	RECO		ALL/DAY)	RECORD	(GALL/DAY)	(INCHES)	NUMBER	TYPE	
	,	0		۵	32000	0	14000		TZED 0			
		Ö		ò	32000	0	14000					
		ā		ò	32000	ū	14000					
		n		Ô	32000	ō	14000					
		0		Ó	32000	a	14000					
		ō		ō	32000	ñ	14000					
	GR	OUNDWA	TER H	ONITORING					NOWATER CONTAMIN	NATION POTENTIA	L	
NO.					DRINK WATERS	*UNST	Gw AVL	G# QLT W	AST HIRD OVER	RALL GW HEALTH	MISC	TEAM
ELL	S SAMPLE	FRFO	FRO	M ANAL.	QUAL CHANGS	*RTNG&CON	RATING CON	RATING CON	RATING UDN CONT	TAM POT HERD	CON IO	ID NO
0	NO					+ 20 A	3C A	5 A	4 4	14 46	8	2301
o	NO	NF			UNKN #	* 50 A	3C A	5 A	4 .	14 48	B	2301
ò	NO					* 50 A	3C A	5 A	4 A	14 48		2301
ō	NO					* 20 A	3c A	5 A	4 A	14 48		2301
á	NO					* 20 A	IC A	Š Ä	4 .	14 48		2301
Á		A.E				+ 3n A	10	Ē Ā	á) A	14 48		2301

SHAFACE IMPOUNDMENT ASSESSMENT (SIA)

NPDES NO.

490022331

SIC CODE

4952

STATE ID NO. UTE173 LATITUDE 37051F218 LONGITUDE 112051M558 OPERATORS. DWNERS PARUMAN PAROMAN PO BOX 576 PO 80X 576 #AROMAN
UT 84761
FACILITY IDENTIFICATION
CATEGORY SIA SITE NO. IMPNOMATS
MUN 29
OPERATIONAL FF.... PAROMAN UT 84761 CNTY/CITY PLACE IRON PAROLAY **OPERATIONAL FFATURES OF IMPOUNDMENTS

IMP. NO		PUPP	OSE	AGE	IN USE	YRS OPEN	LAST YR.	SURFACE AREA	TOTAL SURFACE	IMP. INFLOW	YR. OF RECOR
				(YP)			IN UP.	(ACRES)	AREA (ACPFS)	(GALL/DAY)	
1	W 5.1	10	SPO	11	YFS	11	0	7.45	37.64	140000	1978
2	w S 1	0.1	SPO	1.1	YES	11	0	6.39	37.64	O	0
3	W81	DI.	890	11	YES	11	0	6.34	37.64	0	G G
ŭ	WST	T O	SPO	11	YES	11	0	6,48	37.64	0	0
5	W 51		SPO		YES	11	0	5,71	37.64	0	0
6	w81	10	SPO	11	YES	11	0	5,27	37,64	0	0

IMP.EFFLUENT	YR.OF RECORD	TOTAL AVE. INFLOW (GALL/DAY)	YR.DF RECORD	TOTAL AVE. EFF. (GALL/DAY)	LINER TYPE	THICANESS (INCHES)	LIVESTOCK NUMBER	LIVESTOCK TYPE
n	0	140000	0	0	NONE	0		
0	a	140000	0	0	NONE	u		
ø	0	140000	0	0	NONE	a		
O	n	140000	0	0	NONE	4)		
n	0	140000	0	n	NONE	Ü		
o	1978 -	140000	0	٥	NONE	0		

	g.	3478 .	140000	8		u			NUNE		O .				
	GROUNDWAT	EP MONITORIN	G * *					#GR(JUNDHATER	CON.	TAMINATION P	DTENTIA	L		
NO.	GROUNDWATER	GW CHANGES	DRINK HATE	R**UNST	GW AVL		GW QLT		WAST HZR		DVERALL GW	HEALTH		#1SC	HAST
WELLS	SAMPLE FRED	FROM ANAL.	QUAL CHANG	S**RING&CCN	RATING	CON	RATING	CON	PATING	CON	CONTAM POT	HZRD	CON	ID	ID NO
0	NONF	-	UNKN	** 9B A	5 A	A	5	8	4	B	23	5.4	B		2301
0	NONE		UNKY	** 9B A	54	A	5	8	4	B	23	5.4	6		2301
ø	NONE		UNKN	4 99 A	5 A	A	5	В	4	В	23	5.4	6		2301
0	NONE		UNKN	** 98 4	54	A	5	8	4	Ð	23	5.4	ы		2301
0	NONE		Onk A	** 98 4	54	A	5	B	4	8	23	54	B		2301
0	NGNE		UNKN	** 9B A	54	A	5	В	4	6	53	54	b		2301

SURFACE [MPOUNDMENT ASSESSMENT (STA)

******* **LOCATION OF ASSESSMENT** STATE ID 50. LATITUDE 410164595 LONGITUDE 1120024395 OWNERS

PLATH CITY SEMER DISTRICT
PO BOX 2017 **OPERATORS** PLAIN CITY SEWER DISTRICT PO ROX 2017 ODGEN DDGEN ut Basea UT 84404 **FACILITY IDENTIFICATION**
CATEGORY SIA SITE NO. IMPNDMNTS CHTY/CTTY PLACE NPDES NO.

				(NTY/CTTY	,	PLA	CF	С	ATFG	ONY SIA	SITE	NO.	IMPND	MNTS	NPDES	NO.	81	C CODE			
					ERFR	CI AT	IN CI		-	PLN		3 (490021	126		1952			
				•	5			• •	_		RATIONAL							-				
										-0-5	- A I I UNAL	. rc=	10768	na fra	COMPACA							
	THP.	e of t	0110	POSF	AGF	120	HSE	- 4	18 0	D# L	LAST Y		SURFA		A TOTA	L SURFA	e 6	IMP.	NELO.	ve o	RECO	e n
			<i>p</i> 5.	, , , , ,				,,												11.80	ACSO	~0
					(YP)				_		IN OP.		(ACRI		AKEA	CACRES	3	(GALL/C				
	+	5	FCDNO	PARY	8	YES	3		e		0		0	.00		35.01			1000	19		
	2		ECON	DARY	8	YES	1		6		9		0	0.0		35.00		700	000	19	15	
	3		ECON	YRAC	8	YES	1		ě		٥		0	0.0		35.06		700	000	19	15	
	4		FEDNE		8	YES			8		0			00		35.00		700	000	19	15	
			ECON		Ā	YES			Ā		ň			00		35.00			000	19		
			ECON		ĭ	YES			_		ň			00		35.00			000	19		
	6	٠	IC L. WITE	JAC 1	•	16.0	•		•		"		U.	. 0 17		33,00		,,,,	70110		, 3	
1	IMP.E	FF: 1	E NT	YR.OF	TOTA	L AVE		FLOW	YR	. GF	TOTAL	AVF.	FFF.	1 TM	EP TYPE	THICK	NESS	1.11	ESTOCK	1.19	ESTOCK	
		_		RECOR		ALL/O				COAD		/DAY					HES)		MBER		TYPE	
	(GALL												,			(TVC	ucai	191	PROEK		1105	
		0000		1975			000			975		10000			NONE		9					
		0000		1975		400	000			975		10000			NONE		0					
	61	0000	0	1975		400	000		1	975	60	0000			NONE		13					
	61	0000	0	1975		400	000		11	975	6.0	0000			NONE		Ü					
		0000	0	1975		400	000		11	975	60	0000			NONE		6					
		0000		1975			000			975		0000			NONE		n					
					NITORING				•	* * 2	•••			++60			AMTM	ATTON :	OTENTIA			
	GROU				HANGES			F0+41	(b) e T		GH AVL		AL. 01		WAST P			ALL GH			#18C	WAST
													GH G									
LD	SAMP		_	FHUM	ANAL.					e L G N	RATING	COM	R# 1 41	ME COM	HAIIN	IG CON			HZRD	CON	10	ID N
)		NÜNE				ι	INK 4		7 C	A	30	A	5	A	4	A		19	7 A	8	€	2301
)		NON€				L.	NKN	**	76	A	3 C	Δ	5	A	4	A		1'9	7.4	Ł	E	5301

NO.	GROUNDWATER	GH CHANGES	DRINK WATE	R * #	UNST		GW AVL		GH QLT		HAST HER	D	OVERALL GH	HEALTH		#18C	HAST
WELLB	SAMPLE FREQ	FROM ANAL.	QUAL CHANG	3 * ± !	PTNG	CCN	RATING	COM	RATING	CDN	RATING	CON	CONTAM POT	HZRD	CON	10	ID NO
0	NONE		UNKN	**	7 C	A	3C	A	5	A	4	A	19	7A	8	€	2301
0	NON€		UNKN	**	70	A	3C	Δ	5	A	4	A	1.9	7 A	B	Ε	2301
0	NONE		UNKN	**	7C	A	36	A	5	A	4	A	19	7.4	ㅂ	E	5301
0	NONF		UNKN	**	7 C	A	3 C	A	5	A	4	A	19	7.4	Ħ	E	5301
0	NONE		UNKN	* *	70	A	3 c	A	5	A	4	A	19	7.4	Ħ	E	2301
0	NONF		flyk.v	**	70	A	3 C	A	5	å	4	A	19	7 ▲	B	£	2301

SURFACE IMPOUNDMENT ASSESSMENT (SIA)

LOCATION OF ASSESSMENT

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NONE

STATE ID NO. UTTG12 LATITUDE D M 5 LONGITUDE DWNERE OPERATORS RICHMOND PICHMOND 6 WEST MAIN 6 WEST MAIN RICHHOND RICHMOND UT 84333 UT 84333 **FACILITY IDENTIFICATION** PLACE CATFGORY SIA SITE NO. IMPNDMNTS SIC CODE CHTY/CITY NPUES NC. CACHE RICHHOND 499020907 4952 MUN 3 1 **OPERATIONAL FEATURES OF IMPOUNDMENTS** IMP. NO. LAST YR. YPS OPEN SURFACE AREA TOTAL SURFACE IMP. INFLOW YR.OF RECORD PURPOSE AGF IN USE AREA (ACRES) (ACRES) (GALL/DAY) (YP) IN OP. 1978 WST DI SPO YER 0 6,70 27.46 100000 #ST DI SPO YES 0 5.70 27.46 0 YES 27.40 WST DI SPO ٥ 5.50 DI SPO 27.40 *ST YES. 9.50 IMP.EFFLUENT YR.OF TOTAL AVE. EFF. LINER TYPE THICKNESS LIVESTOCK TOTAL AVE. INFLOW YR.DF LIVESTOCK RECORD (GALL/DAY) (GALL/DAY) PECDAD (GALL/DAY) (INCHES) NUMBER TYPE n 100000 O NONE t) 0 0 100000 NONE 100000 NONE 0 0 100000 NONE **GROUNDWATER MONITORING** **GROUNDWATER CONTAMINATION POTENTIAL ** NO. GROUNDHATER GW CHANGES DRINK WATER**UNST GW AYL GW GLT HAST HEAD DVEHALL GH HEALTH MAST WELLS SAMPLE FREQ FROM ANAL. QUAL CHANGS**RTNGBCON RATING CON RATING CON RATING CON CONTAM POT HZRD CON 10 ID NO UNKN ## 5C A 2301 3C 17 5A ٥ NONE A 5 NONE UNKN ** 5C 3 C 17 54 1025 UNKN ** 5C 3 C 17 £ 2301 54 0 NONE ٨ 4

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SURFACE IMPOUNDMENT ASSESSMENT (STA)

LOCATION OF ASSESSMENT LATITHOF O H S LONGITUDE STATE IS NO. UTGA74 OPERATORS DWNERS ROOSEVELT CITY RODSEVELT CITY STATE STREET AND LAGUER STREET STATE STREET AND LAGOON STREET RODSEVELT ROOSEVELT UT 84066 UT 84066 **FACILITY IDENTIFICATION** PLACE CATEGORY SIA SITE NO. IMPNDANTS MEDES NO. SIC CODE CHTY/CITY 490020328 DUCHESNE ROOSEVELT 32 4952 **OPERATIONAL FEATURES OF IMPOUNDMENTS** IMP. NO. PURPOSE AGF IN USE LAST YR. SURFACE AREA TOTAL SURFACE IMP. INFLOW YR.OF RECORD (ACRES) AREA (ACPES) (Y8) IN OF. (GALL/DAY) YES n 15.00 38.60 SECONDARY 0 38.60 5.10 0 SECONDARY YES Λ 0 38.60 0 SECONDARY YES 5.00 38.60 SECONDARY YES 5,00 O SECONDARY 4.10 38,60 Ω YES 38.60 SECONDARY YES 4,40 LINER TYPE THICKNESS LIVESTOCK LIVESTOCK TOTAL AVE. INFLOW YR.OF TOTAL AVE. EFF. IMP.EFFLUENT YH.OF (INCHES) NUMBER TYPE PECORD (GALL/DAY) RECORD (GALL/DAY) (GALL/DAY) 200000 NONE NONE 200000 200000 MONE 200000 NONE 200000 NONE 0 1973 500000 NONE **GROUNDWATER MONITORING** **GROUNDWATER CONTAMINATION POTENTIAL ** GROUNDHATER GW CHANGES DRINK MATERALUNST HAST HZRD OVERALL GM HEALTH Gh AVL GW QLT HISC WAST ID ND RATING CON RATING CON CONTAM POT HZRD CON WELLS SAMPLE FREQ FROM ANAL. QUAL CHANGS ** FTHG&CCH RATING CON ID ** 50 2301 3.0 54 NONE HNKN ь 1022 NONE 3C 17 54 UNKN ** 5C 19 3 C 17 54 2301 NONE . ٥ 17 2301 54 0 NONE UNKN ** 5C ŧ 30 6 ** 50 3Ĉ 17 54 2301 NONE HMKN 5

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NONE

SURFALE IMPOUNDMENT ASSESSMENT (STA) ***********

##LOCATION OF ASSESSMENT##

STATE TO UR. UTFIAZ LATITION D M S LONGITUDE OWNERS OPEPATOF# TROPIC TOWN PO HOX 130 TROPIC TOWN TROPIC TOWN PO BOX 130 TROPIC TOWN UT 84776

##FACILITY IDENTIFICATION## CATEGORY SIA SITE NO. IMPNOMNTS CNTY/CITY PLACE NPDFS NO. STC CODE GARFIFLO TROPIC MUM 490023370 4952 **OPENATIONAL FEATURES OF IMPOUNDMENTS** IMP. NO. PURPOSE AGF IN USE YRS OPEN LAST YR. SURFACE AREA TOTAL SURFACE IMP. INFLOW

				(YP)			IN OP.	(ACRES)	AREA	(ACRES)	(GALL/DAY)	
1	¥51	ST	ORA	a	YFS	O	ñ	2,80		10,80	50000	1978
5	MST	ST	ORA	O.	YES	O .	0	3.20		10.80	0	٥
3	# S T	ST	ORA	O.	YFS	O	0	2.80		10.80	ø.	0
4	WST	ST	ORA	O	YES	0	. 0	2.00		10.80	0	0
INP.EF	FLUENT	YR	OF.	TOTAL	AVE. INFLOR	YR.OF	TOTAL AVE.	FFF. LINER	TYPE	THICKNESS	LIVESTOCK	LIVESTOCK
(GALL/	DAY)	RE	CORD	(GA	LL/DAY)	RECORD	(GALL/DAY)		(INCHES)	NUMBER	TYPE
	0		Ð		50000	0	0	N	IONE	a		
	0		0		50000	0	8	· N	ONE	9		
	0		Ą		50000	0	0	N	ONE	ü		
	0	1	978		50000	9	0	. N	ONE	4		

YR.DF RECORD

	GRQUNNWAT	ER MONITOPIN	6		•				* * GP (TUNDWATER	C041	TAMINATION P	OTENTIA	L**		
NO.	GROUNDWATER	GH CHANGES	DRINK MATE	TRAULERS	6	IN AVL		GW OLT		HAST HZR	D	OVERALL GH	HEALTH		HISC	WAST
WELLS	SAMPLE FRFQ	FROM ANAL.	GUAL CHANG	S**RTNG	KCEN F	EATING	CON	RATING	CON	RATING	CON	CONTAM POT	HZRD	CON	10	ID NO
0	NONE		UNKN	** 30	A	3 C	À	5	A	4	Ð	15	46	8		2301
0	NONF		UNKN	** 30	A	3 C	A	5	A	4	F	15	48	병		2301
Ð	NONE		LINKY	** 30		3C	A	5	A	4	8	15	48	8		1025
0	NONE		UNKN	** 30	A	3.0	4	5	A	4	- 6	15	48	8		2301

SUFFACE IMPOUNDMENT ASSESSMENT (SIA)

LOCATION OF ASSESSMENT STATE IN NO. CTIONS LATITUDE D M S LOMGITUDE D M 8 OWNERS OPERATORS MELLSVILLE 92 EAST FIRST SOUTH WELLSVILLE 92 EAST FIRST SOUTH PELLSVILLE HELLSVILLE UT 84339 UT 84339 **FACILITY IDENTIFICATION** CATEGORY SIA STIE NO. IMPADMATS NPDES NO. CHTY/CITY PLACE SIC CODE WELLSVILLE CACHE MLN 35 490020371 4952 **OPERATIONAL FEATURES OF IMPOUNDMENTS** IMP. NO. PURPOSE AGF IN USE YPS OPEK LAST YR. SURFACE AREA TOTAL BURFACE IMP. INFLOW YH. OF HECORD IN OP. (ACRES) AREA (ACRES) (GALL/DAY) 56.00 D1 SP0 YFS 0,00 KST *81 DI SPO YE 8 0 0.00 56.00 DI SPO 0.00 YFS 0 0 56.00 0 w S Y WST DI SPO YES 0.00 56,00 IMP.EFFLUENT YR.OF TOTAL AVE. THELOW YR. OF TOTAL AVE. EFF. LINEP TYPE THICKNESS LIVESTOCK LIVESTOCK (GALL/DAY) FECORD (GALL/DAY) RECORD (GALL/DAY) (INCHES) NUMBER TYPE NONE 0 NONE NONE ٥ NONE **GROUNDWATER MONITORING** **GROUNDWATER CONTAMINATION POTENTIAL ** NO. GROUNDWATER GW CHANGES DPINK WATER & UNST GW OLT WAST HZPD OVERALL ON HEALTH MISC WAST GW AVL MELLS BAMPLE FREQ FROM ANAL. QUAL CHANGS+ARTNGECON RATING CON RATING CON CONTAM POT HZRO CON ID NO YES 4# 1F 1 € 5 11 48 2301 NONE ## 1E IE 11 48 2301 NONE 5 48 2301 0 YFS A 16 **A** -11

** 1E

NONE

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SUPFACE IMPOUNDMENT ASSESSMENT (SIA)

LOCATION OF ASSESSMENT

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STATE IL NO. UTA 64 LATITUDE 40043MOS LENGITUDE 114000MOES OWNER . OPERATOR# MENDOVER MENDOVER PO 60x 326 PO BOX 326 WENDOVER WENDOVER UT 84083 UT 84983 **FACILITY IDENTIFICATION** NPDES NO. CNTY/CITY PLACE CATEGORY SIA SITE NO. IMPNOMNTS SIC CODE TODFLE HENDOVER 36 4952 **OPERATIONAL FEATURES OF IMPOUNDMENTS** IPP. NO. PUPPUSE AGE IN USE LAST YR. SURFACE AREA TOTAL SURFACE IMP. INFLOW YR.OF RECORD AREA (ACRES) (ACRES) (GALL/DAY) IN OP. OI 5PO YFS 17.35 37,70 123000 WST DI SPO YF8 37.70 Ð 4.07 Û WST DI SPO YES 4.07 37.70 DI SPO WST YES ٥ 4.07 37.70 0 W\$7 DI SPO YE8 ð 4.07 37.70 WST DI SPO YES 4.07 37.70 6 IMP.EFFLUENT YR.OF TOTAL AVE. INFLOW YR.OF TOTAL AVE. EFF. LINER TYPE THICKNESS LIVESTOCK LIVESTOCK (GALL/DAY) RECOPD (GALL/DAY) RECORD (GALL/DAY) (INCHES) NUMBER TYPE 123000 0 NONE 0 123000 0 NONE 0 Ð ٥ 0

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	GROUNDWAT	ER MONITORIN	G				4	**GRO	UNDWATER	CONT	MAHINATION P	OTENTIAL			
NO.	GROUNDWATER	GH CHANGES	DRINK HATER	**UNST	GW AVL		RW OLT		MAST HZRE	· ·	OVERALL G.	HEALTH		MISC	HAST
WELLS	SAMPLE FREG	FPOM ANAL.	QUAL CHANGS	**PTNG&CCN	RATING	CON	RATING	CON	RATING	CON	CONTAM POT	HZRD	CON	ID	ID NO
0	NONE		N/A	* 4 5D B	90	В	5	Ħ	4	Ð	20	3 A	C		2301
0	NONE		4/4	** 50 E	9 D	6	5	В	4	9	50	34	C		2301
0	NONE		N/A	** 20 B	9 D	8	5	8	4	6	20	34	C		2301
0	NONE		N/4	4 30 8	90	8	5	8	4	A	50	34	C		2301
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NONE

SURFACE IMPOUNDMENT ASSESSMENT (SIA)

AMERICATION OF ASSESSMENTAM STATE ID NO. UTFIRE LATITUDE 37042MONS LONGITUDE 112039MONS OHNERS OPERATOR* DIXIE NATIONAL FOREST DIXIE NATIONAL FOREST PO BUX 580 PO BOX 589 UT84720 CEDAR CITY CEDAR CITY UT 84720 UT 84720 **FACILITY IDENTIFICATION** CHTY/CITY PLACE CATEGORY SIA SITE NO. IMPNOMNTS NPDES NO. SIC CODE IPON CEDAR CITY MUN 37 4952 **GPERATIONAL FEATURES OF IMPOUNDMENTS** TMP. NO. PHEPOSE AGE IN USE YRS CPEN LAST YR. SURFACE AREA TOTAL SUPFACE IMP. INFLOW YF.OF RECORD IN CP. (ACRES) (YF) AREA (ACRES) (GALL/DAY) STABILIZE 1977 0.50 1.00 197 YE8 1.00 10725 1977 STABILIZE 0.50 IMP. EFFLUENT YR. OF TOTAL AVE. INFLOW .YP.DF TOTAL AVE. EFF. LINER TYPE THICKNESS LIVESTOCK LIVESTOCK RECORD (GALL/DAY) RECORD (GALL/DAY) NUMPER (GALL/DAY) (INCHES) TYPE 1977 10725 1977 BUTYL GUBBER 1977 1977 BUTYL RUBBER 10725 **GROUNDWATER MONITORING** **GROUNDWATER CONTAMINATION POTENTIAL** GROUNDWATER GH CHANGES DRINK WATER ** UNST Gw AVL GW GLY WAST HIRD OVERALL GW HEALTH HISC WAST FROM ANAL. QUAL CHANGS**RINGSCON RATING CON HERD CON ID HELLS SAMPLE FRFG RATING CON RATING CON CONTAM POT ID NO NONE UNKN UNKN ## 78 9 3.4 B 8 28 2301 5 19 Ð NONE LÍNKN UNKN ## 7P 34 19 28 2301 SURFACE IMPOUNDMENT ASSESSMENT (SIA) **LOCATION OF ASSESSMENT** LATITUDE 37031MOOS LONGITUDE 112042MOOS STATE ID NO. UTF184 OHNER= OPERATORE DIXIE NATIONAL FOREST DIXTE NATIONAL FOREST PO EOX 580 PO BOX 580 CEDAP CITY CEDAR CITY UT 84720 UT 84720 **FACILITY IDENTIFICATION** CATEGORY SIA SITE NO. IMPNOMATS CHTY/CITY PLACE NPDES NO. SIC CODE BEAVER 38 4952 ** UPERATIONAL FEATURES OF IMPOUNDMENTS ** SURFACE AREA TOTAL SURFACE IMP. INFLOW YR. OF RECORD IMP. NO. PUPPOSE AGF IN USE LAST YP. AREA (ACHES) (GALL/DAY) (YR) IN OP. (ACRES) STABILIZE 1976 2.00 3,50 197 NO 197 STABILIZE 1976 2.00 3.50 INP FFFLUENT YR. OF LINER TYPE THICKNESS LIVESTOCK LIVESTOCK TOTAL AVE. INFLUM YR. OF TOTAL AVE. EFF. PFCOPO NUMBER TYPE (GALL/DAY) (GALL/DAY) PECOHD (GALL/DAY) (INCHES) 1977 8000 197 Λ CLAY 1977 8000 197 0 CLAY **GROUNDWATER CONTAMINATION POTENTIAL ** **GROUNDSATEN MONTTORING** GEOUNDWATER GN CHANGES ONITH HATEPONUNST MAST HIRD OUF HALL GH HEALTH MISC #AST GP QLT G. AVL WELLS SAMPLE FFFO FFOR ANAL. GUAL CHANGSHARINGROON RATING CON-RATING CON RATING CON CONTAM POT HIRD CON ID ID NO NONE IINKY ** 88 E 34 5 k 20 44 2301 0 TINKN h A ш

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SURFACE IMPOUNDMENT ASSESSMENT (SIA)

YES

(YF)

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LATITUDE ANDIRMASS CONGITUDE 111015H498 STATE TO DO. UTKOR? OKNEPE OPFPATORE USDA FOREST SERVICE UINTA HEBER RANGER DISTRICT PO BOX 1428 FEDERAL BUILDING 125 EAST 100 NORTH PRGVO HEBFR UT 84601 UT 84032 **FACILITY IDENTIFICATION ** CNTY/CITY PLACE CATEGORY SIA SITE NO. IMPNDMNTS NPOFS NO. SIC CODE BEAVER 30 MEN ú 4952

IN OP.

0

OPERATIONAL FEATURES OF IMPOUNDMENTS

IMP. NO. PURPUSE AGE IN USE YES OPEN LAST YE. SURFACE AREA TOTAL SURFACE IMP. INFLOW YE.OF RECORD

(ACRES)

1.00

AREA (ACRES) (GALL/DAY)

1.00

IMP.EFFLUENT YP.OF TOTAL AVE, INFLOW YR.OF TOTAL AVE. EFF. LIMER TYPE THICKNESS LIVESTOCK LIVESTOCK (GALL/DAY) RECORD (GALL/DAY) (INCHES) NUMBER TYPE

O O NOME O

GROUNDWATER MONTIUPING

NO. GROUNDWATER GH CHANGES DPINK WATER**UNST GH AVL GH QLT WAST HZRU OVEFALL GH HEALTH HISC WAST
WELLB SAMPLE FROM ANAL. QUAL CHANGS**ARTHGSCON RATING CON RATING CON CONTAM POT HZRD CON ID ID NO

O NOME UNKN UNKN ** 78 8 38 8 5 8 4 6 20 48 8 2301

SUPPACE IMPOUNDMENT ASSESSMENT (SIA)

STATE ID HU. UTI122 OWNERS GUNNISON

GUNNISON GENERAL DELIVERY GUNNISON **LUCATION OF ASSESSMENT**
LATITUDE 39008M458 LONGITUDE 1110508418
OPERATOR=

GUNNISON
GENFPAL DELIVERY
GUNNISON
UT 86340

UT 86340 UT 86340 **FACILITY IDENTIFICATION** CHTY/CITY PLACE CATEGORY SIA SITE NO. IMPNOMNTS NPDFS ND. SIC CODE SAN PETE GUNNISON 49 4952 **OPERATIONAL FEATURES OF IMPOUNDMENTS** LAST YR. YPS OPEN SUPPACE AREA TOTAL SURFACE IMP. INFLOR YR. OF RECORD IMP, NO. PURPOSE AGE IN USE IN OP. (ACRES) AREA (ACRES) (GALL/DAY) ST DHA YF8 16,82 55.23 0 n WST ST OFA YES O 22,93 55.23 0 WST ST OPA YES 55,23 15.48 ۵ IMPREFFLUENT YR. OF TOTAL AVE. INFLOW YR.OF TOTAL AVE. EFF. LINER TYPE THICKNESS LIVESTOCK LIVESTOCK PECORD (GALL/DAY) (GALL/DAY) PECORD (GALL/DAY) (INCHES) NUMBER TYPE 0 NONE NONE Û 0 G NONE 0 **GROUNDWATER MONTTORING** **GROUNDWATER CONTAMINATION POTENTIAL** NO. GROUNDWATER GH CHANGES DRINK WATER ** LINST GW AVL GW QLT HAST HIRD OVERALL GH HEALTH HISC WAST FROM ANAL. GUAL CHANGS++PINGSCON RATING CON RATING CON RATING CON CONTAM POT HIRD CON ID

WELLS SAMPLE FREQ ID NO UNKN ** 1E A 0 NONF HNKN 54 5 15 10 1025 ** 18 0 NONE LINKN UNKN 54 5 15 10 2301 ** 15 Ĝ NONE UNKN UNKN 15 10 2301

SURFACE IMPOUNDMENT ASSESSMENT (SIA) *********

LOCATION OF ASSESSMENT

LATITUDE 40058m515 LONGITUDE 109042M105 OPERATOR= STATE 10 NO. UTROST OWNERS MANILA HANTLA

MANTLA

MANTIA

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				NTY/CITY	PLA	CF	CATEG	DRY SI	SITE	E NO.	IMPNDMN	ITS	NPDES NO		SIC CODE		
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			-					RATIONAL				INDHENT	S**				
								,					•				
	IMP. NO	. PU	RPCSE	AGF	IN USE	Y	S OPEN	LAST	YR.	SURFAC	E AREA	TOTAL	SURFACE	IMP.	INFLOW	YR.OF RE	CORD
				(Yr)				IN OP.		(ACRE	8)	AREA	(ACRES)	(GALL.	/DAY)		
	1	PPIMA	FY	16	YES		16	0		1.	45		7,00		45000	1978	
	2	PRIMA	DV	16	YES		16	0			15		7.00		0	۵	
	ĩ	PRIMA		16	YES		16	ň			95		7.00		o.	0	
	ã	PRIMA		16	YES		16	. 0			94		7.00		0	ň	
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	4	PRIMA		16	YES		16						7.00		*	•	
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	,	-K1M#	184 1	16	15.3		16	U		· · ·	69		7.00		v	v	
	INP.EFF	LUENT	YR.UF	TOTA	L AVE. IN	FLOW	YR.OF	TOTAL	AVE.	EFF.	LINER	TYPE	THICKNES	5 L:	IVESTOCK	LIVESTO	CK
	(GALL/D	AYE	PECOP		ALL/DAY)		PECORD		L/DAY)		•		(INCHES	1	NUMBER	TYPE	
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NO.					DRINK HAT			GW AVL		GW OL		AST HZ		RALL GI			
MELLS	SAMPLE	FHFQ	FRON	ANAL.	QUAL CHAN			RATING	CON	PATIN	G COM	RATING	CON CON	TAM PO		CON ID	ID NO
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ò	NO				UNKN	**		16	Ā	š	Ā	4	š	11	5.4	Ā	2301
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SURFACE IMPOUNDMENT ASSESSMENT (S14)

LOCATION OF ASSESSMENT

STATE IC NO. LIP 72 LATITUDE D M S LONGITUDE D M S OPEPATOR*

NECLA

NEOLA UT 84107 NFOLA UT 84107 **FACILITY IDENTIFICATION**

NEOLA

FACILITY IDENTIFICATION

CNTY/CITY PLACE CATEGORY SIA SITE ND. IMPNOMNTS NPDES NO. SIC CODE

DUCHFSNE NEOLA PLN 43 3 0 4952

DPERATIONAL FEATURES OF IMPOUNDMENTS

IMP.	NO	•	PURP	OSE	AGF	IN US	IE YR	S OPEN	LAST YR. In op.	SURFACE (ACRES		-	SURFACE (ACRES)	IMP. INFLOW (GALL/DAY)	YR.OF RECORD
	1	WS T	ST	OPA	้อ้	YFS		G	٥	3.0	5		0.00	0	0
	2	HST	81	ORA	0	VES		n	0	1.7			0.00	0	0
	3	45 T	ST	OHA	0	YES		0	0	1,5	7		0.00	0	0
THP.	EFF;	LUEN	7 4	P.OF	TOTAL	AVE.	INFLOW	YR.OF	TOTAL AVE.	EFF.	LINER	TYPE	THICKNESS	LIVESTOCK	LIVESTOCK
(GAL	L/D	AY)	P)	FCOPI) (GA	LLIDAY)	HECORD	(GALL/DAY)			(INCHES)	NUMBER	TYPE
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		0		0			0	0	٥		N	ONE	Q		
		0		P			ß	0	0		N	ONE	0		

ER MONTTORING**

GW CHANGES DRINK WATER**UNST GW AVL GW QLT WAST MZRD OVERALL GW MEALTM
FROM ANAL. QUAL CHANGS**RTNG&CON RATING CON RATING CON CONTAM POT MZRD CO **GROUNDWATER MUNITORING**
ND. GROUNDWATER GW CHANGES DRINK WATER**UNST HISC HAST HIRD CON ID ID NO WELLS SAMPLE FRFQ ** 2E A ** 2F A ** 2E A 3C 3C 3C NONE YES 14 48 1055 0 NONE 14 48 1015 NONE 48 2301

SURFACE IMPUUNDMENT ASSESSMENT (SIA) **********

LOCATIO* OF ASSESSMENT
LATITUDE O N 5 LONGITUDE O M S OPERATORS STATE IS NO. DTH032 OWNER#

F	3							PFRR	Y				
	PFARY JT 84302			ITY/CTTY ELDER		MUI	*#FACILITY GORY SIA SIT * # FRATIONAL FEA	E NO. IM 4	#302 #TION++ PNDMNTS	NPDFS %0. 0	STC CODE 4952		
	1MP. NU. 1 %S 2 %S 3 %S 4 %S 5 %S	T 81 T S1	PUSE I GRA I GRA I GRA I GRA I GRA	AGE (YP) 0 0 0	AES AES AES AES Tu nsw	YRS OPEN 0 0 0 0	LAST VR. IN OP. 0 0 0	8URFACE (ACRES) 9.00 3.74 4.69 4.55	AREA TOTAL	. SURFACE	IMP. INFLOW (GALL/DAY) 0 0 0 0	YF.OF RECOR	ŧD
	IMP.FFFLUE (GALL/DAY) 0 0 0	F	/H.OF PECORE 0 0 0) (G	L AVE, INFI ALL/DAY) 0 0 0	YR.OF FECOR 0 0 0 0	TOTAL AVE. O GALL/DAY O O O)	LINER TYPE NONE NONE NONE NONE	THICKNESS (INCHES) 0 0 0	LÎVESTOCK NUMBER	LIVESTOCK TYPE	x ⁻
NO. WELLS O O O		FR	GW CH		## DRINK WATEI QUAL CHANG! YES YES YES YES YES		GW AVL RATING CON 3C A 3C A 3C A 3C A	G. GLT	HAST HZ	RD OVERA CON CONTA B B B B	ATION POTENTIA LL GM HEALTH H POT HZRD 21 5a 21 5a 21 5a 21 5a 21 5a		T8AW IO NO 2301 2301 2301 2301

SURFACE IMPOUNDMENT ASSESSMENT (SIA) ************* **LOCATION OF ASSESSMENTAL STATE ID NO. GTHO32 LATITUDE 41025M295 LDNGITUDE 112003M388 OWNERS WILLARD BAY STATE PARK UTAH STATE DIV PARKS AND RECHEATION 1596 FEST TEMPLE PO BOX 319 WILL ARD SALT LAKE CITY UT AUIIB UT 84340 **FACILITY IDENTIFICATION** CHIANCLIA PLACE CATEGORY SIA SITE NO. IMPNOMNTS NPDES NO. SIC CODE BOX FLDER HILLARD MUN 45 3 4952 **OPERATIONAL FEATURES OF IMPOUNDMENTS** IMP. NO. PURPOSE AGE IN USE YRS OPEN LAST YR. SURFACE AREA TOTAL SURFACE IMP. IMPLOW (YR) IN OP. (ACRES) AREA (ACRES) (GALL/DAY) 17.70 YFS 0 8.84 113000 DI SPO 4 WST DI SPO YES 4.60 17.70 17.70 WST DI SPO YES 4.26 IMP.EFFLUENT YR.OF TOTAL AVE. INFLOW YR.OF TOTAL AVE. EFF. LINER TYPE THICKNESS LIVESTOCK PECORD (GALL/DAY) RECORD (INCHES) (GALL/DAY) (GALL/DAY) NUMBER 113000 0 O CLAY 113000 CLAY ۵ 0 1974 113000 CLAY **GROUNDWATER MONITORING** **GROUNDWATER CONTAMINATION POTENTIAL ** NO. GROUNDWATER GA CHANGES DRINK WATERARUNST G4 AVL Gh QLT WAST HZRD OVERALL GH HEALTH WELLS SAMPLE FREQ FROM ANAL. QUAL CHANGS++RING&CON RATING CON RATING CON RATING CON CONTAM POT HZRD CON UNKN ** 5C A В 0 NONE 54 19 4B 19 ٥ NONE UNKN 44 50 54 54 19 0 NONE UNKN ** 5C SURFACE IMPOUNDMENT ASSESSMENT (SIA) ********* **LOCATION OF ASSESSMENT** LATITUDE 37038HUNS LONGITUDE 112010H248 STATE ID NO. UTHIS OWNERS OPERATOR= BRYCE CANYON NATIONAL PARK NATIONAL PARK SERVICE 125 SOUTH STATE GENERAL DELIVERY BRYCE CANYON

SALT LAKE CTTY UT 84138 UT 84717

r (1)

FACILITY IDENTIFICATION NPDFS NO. SIC CODE CHTY/CITY PLACE CATEGORY SIA SITE ND. IMPNOMNTS GARFIFLD BRYCE CANYON MUN 46 n 4952 **OPERATIONAL FEATURES OF IMPOUNDMENTS**

YR.OF RECORD

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LIVESTOCK

TYPE

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В

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MISC WAST

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		•	#ST		SPO			YES			15	0			1,20			5.10		55000	19	78	
		•	#ST		SPO			YES			15	ő			2,80			5.10		5000	19		
		,	-51	וט	SPU	12		163			1 3	U			2,00	•		2011		,,,,,	• •	, •	
	IMP.	. EFF	LUEN	T Y	P.OF	T	OTAL	AVE.	INFLO	i in-	YP.OF	TOTAL	AVE.	FFF.		LINES	TYPE	THICKNE	SS L	IVESTOCK	LIVE	ESTOCK	
	(GAI	1.70	4 4 3	н	ECOR)	(GAL	L/DA	Y)		RELON	C (GAL	LIDAY)				(INCHE	8)	NUMBER	•	TYPE	
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NO.	GP(DUND	ATF	R	G# C!	HANGE	S DP	INK	WATER	#UN	6 T	GK AVL		GW	QL T		MAST H	ZPD O1	/FRALL (Gn HEALTH	1	₩18C	MAST
WELLS	SA	MPI E	FHE	G.	FROM	ANAL	. 00	AL C	HANGS	*#1	MORCC	N RATING	CON	RAT	ING	CON	RATIN	G LNN CO	NTAM PO	ORSH TO	CON	ID	ID NO
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SHRFACE IMPOUNDMENT ASSESSMENT (SIA)

A+LOCATION OF ASSESSMENT++ STATE TO NO. LATTINDE 370310408 LONGITUDE 1100424368 DWNEHE OPERATORE GLEN CANYON NATIONAL RECREATION AREA BULLFROG BASIN DEVELOPED AREA PR BOX 1507 PO BOX 1507 PAGE PAGE AZ 86040 AZ 86040 **FACILITY TOENTIFICATION** CNTY/CTTY PLACE CATEGORY SIA SITE NO. IMPNOMNTS NPUES NO. SIC CODE BEAVER 47 4952 **CPERATIONAL FEATURES OF IMPOUNDMENTS** YRS OPEN LAST YR. SURFACE AREA TOTAL SURFACE IMP. INFLOW YP. OF RECORD THP. NO. PUPPOSE IN USE IN OP. AREA (ACRES) (GALL/DAY) (ACRES) (YR) 1976 WST DI SPO 15 NO 1978 1.92 5.04 5.04 WST DI SPO 15 1978 1976 1.28 0 MO 0 28842 1978 WST DI SPO YFS 0.94 5.04 1 MST DI SPO YES 0.90 5.04 28842 1978 0 LIVESTOCK IMP. FFFLUENT YP. OF TOTAL AVE. EFF. LINER TYPE THICKNESS LIVESTOCK TOTAL AVE. INFLOW YF. OF (INCHES) NUMBER TYPE (GALL/DAY) PECORD (FALL/DAY) RECORD (GALL/DAY) BENTONITE MO 12 1978 28842 1978 0

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	0	1978	28842	1978		0	8	ENTON	ITE MO	i	2			
	GROUNDWAT	FR MONITORIN	G					**GRO	UNDWATER	CONT	AMINATION P	CTENTIAL	1 4	
NO.	GPOUNDWATER	GW CHANGES	DRINK HATER	**UNST	Gx AVL		GW OLT		WAST HZR	D	OVERALL GM	HEALTH	#18C	HAST
HELLS	SAMPLE FREQ	FROM ANAL.	QUAL CHANGS	**FTNG&CCN	RATING	EON	RATING	CON	RATING	CON	CONTAM POT	HZRD (ON ID	ID NO
0	NONE		NO	** 88 A	34	A	4	8	4	8	19	28	8	2301
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SUPPACE IMPOUNDMENT ASSESSMENT (SIA)

LATITUDE 400340438 LONGITUDE 1110038428 STATE ID NO. DILOGS OPERATORS OWNERS WASATCH NATTONAL FOREST WASATCH NATIONAL FOREST 125 SOUTH STATE 125 SOUTH STATE SALT LAKE CITY SALT LAKE CITY UT 84138 UT 84138 **FACILITY IDENTIFICATION** CATEGORY SIA SITE NO. IMPNDMNTS SIC CODE CHTY/CITY PLACE NPDES NO. 4952 HEAVEH 51 **OPERATIONAL FEATURES OF IMPOUNDMENTS** PURPUSE AGE IN USE LAST YR. SURFACE AREA TOTAL SURFACE IMP. INFLOW YR.OF RECORD IN OP. (ACRES) AREA (ACRES) (GALL/DAY) (YR) YES 0.00 ST OHA 0 0.00 -ST WST ST ORA YF5 0.00 0.06 a ST DRA 0.00 0 WST YES 0.00 LIVESTOCK TOTAL AVE. INFLOW YR.DF TOTAL AVE. EFF. LINER TYPE THICKNESS LIVESTOCK IMP . EFFLUENT YP.OF (GALL/DAY) RECORD (GALL/DAY) RECORD (GALL/DAY) (INCHES) NUMBER HYPALON SHEE 0 HYPALON SHEE HYPALON SHEE **GROUNDWATER MONITORING** **GROUND*ATER CONTAMINATION POTENTIAL** WAST HERD OVERALL GN HEALTH GROUNDWATER GH CHANGES DRINK WATERA-UNST Gn AVL GW BLT HISC HAST FROM ANAL. GUAL CHANGS**RTNG&CON PATING CON RATING CON RATING CON CONTAM POT WELLS SAMPLE FREG HZRD 10 ID NO UNKN ** 78 3 4 5 8 8 19 46 2301 MONE HANKA н 8 0 NONE UNKN UNKN ** 78 34 48 2301 19 48 2301 NONE UNKN UNKN ** 7B SURFACE IMPOUNDMENT ASSESSMENT (SIA) ************ **LOCATION OF ASSESSMENT** LATITUDE 40053M436 LONGITUDE 110D48M568 STATE ID NO. UTHOSS DPERATORS OWNER . WASATCH NATIONAL FOREST WASATCH NATIONAL FOREST 125 BOUTH STATE 125 SOUTH STATE SALT LAKE CITY SALT LAKE CITY UT 64138 HT AUITA **FACILITY IDENTIFICATION** CNTY/CITY PLACE CATEGORY SIA SITE NO. IMPNOMNTS NPDES NO. SIC CODE BEAVER 52 4952 ** OPERATIONAL FEATURES OF IMPOUNDMENTS ** PURPOSE SUPPACE AREA TOTAL SURFACE IMP. INFLOW AREA (ACRES) (GALL/DAY) IN OP. (ACRES) YES 10.00 WST ST ORA Ð 0,00 0.00 #ST ST ORA YES 0 0.00 ũ #ST ST ORA YES 0.00 0.00 LINER TYPE THICKNESS LIVESTOCK THP. EFFLUENT YR. OF TOTAL AVE. INFLOW YR.OF TOTAL AVE. EFF. LIVESTOCK (GALL/OAY) PECORD (GALL/DAY) PECOPD (GALL/DAY) (INCHES) NUMBER TYPE HYPALON SHEE n 0 9 0 HYPALON SHEE a Λ 0 HYPALON SHEE **GROUNDWATER MONTTOPING** **GROUNDHATER CONTAMINATION POTENTIAL ** OVERALL GH HEALTH GROUNDLATER GW CHANGES DRINK MATERIALINST GH AVL G= QLT MAST HIPD MAST #1SC WELLS SAMPLE FAFR FPOH ANAL. QUAL CHANGS++RTNG8CCN HATING CON RATING CON RATING CUN CONTAM POT HZRD LON ID 10 NO DOKY ** 98 A NUME HNF 14 5 H 2301 ñ 54 A 4 23 26 ь A NONE HARM UNKN 1055 54 53 28 MANE HARN UNKN 44 9R 23 28 2301

SURFACE IMPOUNDMENT ASSESSMENT (SIA) *******

LOCATION OF ASSESSMENT

LATITUDE 410228395 LUNGITUDE 1110588425 STATE ID MD. GTINGA OWNERS OPERATOR: HASATCH NATIONAL FOREST

WASATCH NATIONAL FOREST 125 SOUTH STATE SALT LAKE CITY

UT 84138

125 SOUTH STATE SALT LAKE CITY UT 84138 **FACILITY IDENTIFICATION**

STC CODE CATEGORY STA SITE NO. IMPNOMNTS NPDFS NO. CHTY/CTTY PLACE 53 4952 BEAVER MUN ** OFERATIONAL FEATURES OF IMPOUNDMENTS **

YPS OPEN LAST YR. SURFACE AREA TOTAL SURFACE IMP. INFLOW YR. OF RECORD IMP. NO. PUPPOSE AGF IN USE AREA (ACRES) (GALL/DAY) (ACRES) (YF) IN OP. 0.50 0.50 0 WST ST CRA 8 YES

LIVESTOCK LIVESTOCK LINER TYPE THICKNESS IMP. FFFLUENT YP. OF TOTAL AVE. INFLOW YP.OF TOTAL AVE. EFF. RECORD (GALL/DAY) (INCHES) (GALL/DAY) RECORD (GALL/DAY) HYPALON BHEE . a

GROUNDWATER CONTAMINATION POTENTIAL **GROUNDWATER MONITORING** GH OLT HAST HEAD OVERALL ON HEALTH GROUNDWATER GW CHANGES DRINK WATER++UNST GW AVL MISC HAST WELLS SAMPLE FREG FROM ANAL. QUAL CHANGS**RTNG&CCN RATING CON RATING CON RATING CON CONTAM POT HERD CON 10 10 NO 4 8 19 48 YES ** 78 8 3A 8 . 5 A NONE Ð

SUPFACE IMPOUNDMENT ASSESSMENT (SIA) ************

LOCATION OF ASSESSMENT

STATE IS NO. UTI132 LATITUDE 18057HA78 LONGITUDE 111052H378 OWNERS OPERATORE

SALINA 90 KEST MAIN STREET SALINA 84 65400

SALINA 90 WEST MAIN STREET SALINA 84 65400

FACILITY IDENTIFICATION NPDES NO. CNTY/CITY PLACE CATEGORY SIA SITE NO. IMPROPRIS SIC CODE SEVIFR SALTNA 54 490020800 4952 Mich **OPERATIONAL FEATURES OF IMPOUNDMENTS**

0.87

YRS OPEN LAST YR. SURFACE AREA TOTAL SURFACE IMP. INFLOW YR.OF RECORD AGE IN USE (YE) IN OP. (ACRES) AREA (ACRES) (GALL/DAY) 1 SECONDARY 5 YES 3.87 511000 1978

IMPREFFLUENT VP.OF TOTAL AVE. INFLOW YR. OF TOTAL AVE. EFF. LINER TYPE THICKNESS LIVESTOCK LIVESTOCK SECORD (INCHES) TYPE (GALL/DAY) (GALL/DAY) RECORD (GALL/DAY) NUMBER

1978 511000 1478 511000 BENTONITE MO **GROUNDWATER CONTAMINATION POTENTIAL** **GROUNDWATER MONITORING** GROUNDWATER ON CHARGES DRINK WATER ... UNST MISC WAST Gm AVL GW GLT WAST HZRD LIVFRALL GW HEALTH WELLS SAMPLE FREG. FROM ANAL. QUAL CHANGSA-FTNGLCCN PATING CON RATING CON PATING CONTAM POT. HIRD CON 10 ID NO NONE NÚ NO ## 50 A 30 A 5 **A** 4 6 17 48 2301

SUFFACE IMPOUNDMENT ASSESSMENT (SIA)

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					**	LOCATION	OF AS	SFSSH	ENT.	*										
STATE	10 NO.	. u1	1064	ı	1	LATITUDE	430	5M 18	i	LONGITU)E 1	15031M9 OPERATO								
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A	ACC SOL	JTH F	ATP									840	0 SOU	TH MAIN						
*	IDVALE											MID	VALE							
U	T 84047	7										UT	84047							
										FACIL	ITY :	IDENTIFI	CATIO	N						
				C:	NTY/CI	TY	PLACE	C	ATEG	URY SIA	SIT	E NO. 1	MPNDM	NTS	NPDES NO	. 510	CODE			
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	GROUND					DRINK				GH AYL		GH OLT		HAST HZ		RALL GW			HISC	
wFiLS	SAMPLE	FRE	0	ŁEO#	ANAL.	GUAL C			SCON	RATING	COM	RATING	CON	PATING	COM COM	TAM POT	HZRD	CON	10	ID NO
0	SEMIAN			N		NO		* 5C		3 A	A	5	A	5	B	15	48	8	E	0
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Store ALE IMPLIED DOEST ASSESSED TO CHEAT *********** **LOCATION IF ASSESSMENT** LATITUDE ADDINGUIS (COSITILE 1111590248 STATE ID NO. UTIO61 OWNERS CPECATORS FILTROL COMPORATION FILTHOL CONFIGATION 2580 ANDREW AVENUE 25FU ANDMEN AVENUE SALT LAKE CTTY SELT LANE CITY 117 84104 IIT FAICE - **F\$FILITY TERRIFICATION ** CHTY/CITY PLACE CATEGORY SIA SITE OC. 1044 18
SALT LAME SALT LAME CITY IND APDES AC. 49/021351 ** OPERATIONAL FEATURES OF IMPOUNDMENTS .. IMP. NO. PUPPOSE AGE IN USE YES OFFE LAST YE. SURFACE AREA TOTAL SURFACE IMP. THEOR YEAUF RECOND (YF) (ACHES) ANEA (ACHES) (GALLICAY) IN OF. \$00.00 1 WST DI SPO 28 YES 360.00 IMP . EFFLUENT YR . OF TOTAL AVE. INFLOW YR.OF TOTAL AVE. EFF. LINES TYPE THICKNESS

(GALL/DAY) RECORD (GALL/DAY) PECORD (GALL/DAY) (INCHES) NUMBER TYPE 1978 ß 36000 197 0 MONE **GROUNDWATER MONITORING** **GROUNDWATER CONTAMINATION POTENTIAL** NO. GROUNDWATER GR CHANGES DRINK WATER . BY ALL GA GLT WAST HZED DYFRALL GA HEALTH MISC WAST

WELLS SAMPLE FRED FROM ANAL. GUAL CHANGS+#RINGECON RATING CON RATING CON RATING CON CONTAH POT HIRD CON ID ID NO NONE UNKN ** 40 A 10 A B B 4 13 34

SURFACE IMPOUNDMENT ASSESSMENT (STA) *****************

LF-CATION OF ASSESSMENT

STATE ID NO. LTHOSE LATITUDE 406446195 LUNGITUDE 1120070098 OPFFATOS= OWNERE MERNOCOTT CEMPER COMPRESSION

KENNOCOTT COPPER LURPURATION 10 EAST TEMPLE SOUTH TEMPLE SALT LAKE CITY

UT 64111

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GENERAL DELIVERY

SIC LODE

3245

3600

LIVESTOCK LIVESTOCK

FACILITY IDENTIFICATION

CATEGORY SIA SITE NO. IMPROMETS NEIFS NE. SIC CODE CHITY/CITY FLACE 3531 SALT LAKE MAGNA INF) 3 3 ** OPERATIONAL PRATURES OF THEOLOGICAL STEEL

	IMP. NO. PI	-	GE 1m USE	YHS OPEN	LAST YH.	SUPFACE APEA		SUFFACE (ACHES)	INF. INFLOW	YR.UF WECO	RO
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	INF FFFI HERT	YR.OF	TOTAL AVE. TOFL	Oh VR.GF	TOTAL AVE.	EFF. LINES	2 TYFE	THICKLESS	LIVESTOCK	LIVESTECK	
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NO.	GRimmond FF#	GA (HAIR)	AS LUTTE WATER	***/15.5.T	ti · ivi.	15 to 12 T 1	AST -Z	₩E P\$##	ALL OF HEALTH	· lâc	~ A S T
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LUCATION OF ASSESSMENT
LATITION 410380415 LONGITUDE 1110520035

STATE 10 un. urinza OPERATORE THE MILLER PACKING COMPANY THE MELLEW PACKING COMPANY 510 MEST 400 NOFTH 510 WEST 400 NORTH HYPLIM HYRILM UT 84319 OT 59319 **FACILITY IDENTIFICATION** CNTY/CITY PLACE CATEGORY SIA SITE NO. IMPNOMNTS NPDFS NG. SIC CODE CACHE HYPUM 110 2011 ** OPERATIONAL FEATURES OF IMPOUNDMENTS ** SURFACE AREA TOTAL SURFACE IMP. INFLOW YR. OF RECORD IMP. NO. PUPPOSF AGF IN USE YPS OPEN LAST YR. (ACRES) AREA (ACRES) (GALL/DAY) (YE) IN OP. 15 VE S 0 5,00 5.00 124000 1978 LIVESTOCK LIVESTOCK TOTAL AVE. INFLOW YP.OF TOTAL AVE. EFF. LINER TYPE THICKNESS IMP.EFFLUENT YR. OF RECORD (GALL/DAY) RECORD (GALL/DAY) (INCHES) NUMBER TYPE (GALL/DAY) 1978 **GROUNDWATER CONTAMINATION POTENTIAL ** **GROUNDWATER MONITORING** NO. GHOUNDWATER GH CHANGES DRINK WATERHAUNST GW AVL GW OLT WAST HIRD OVERALL OW HEALTH MISC WAST NELLS SAMPLE FREG. FROM ANAL. GUAL CHANGS** ORTNOKECH RATING CON RATING CON RATING CON CONTAM POT. HZRD CON 10 IO NO 54 1700 5 3 NONE UNKN UNKN ** OE A 3A . A 11 SURFACE IMPOUNDMENT ASSESSMENT (SIA) **LOCATION OF ASSESSMENTS* STATE ID NO. UTIOSI LATITUDE 40053H028 LONGITUDE 111054H38S OHNERE OPERATOR= PHILLIPS PETROLEUM COMPANY PHILLIPS PETROLEUM COMPANY 393 SOUTH 800 WEST WDODS CROSS a UT 84087 **FACILITY IDENTIFICATION* CNTY/CITY PLACE CATEGORY SIA SITE NO. IMPNOMNTS NPDES NO. SIC COOF 490060507 DAVIS IND 2911 **OPFRATIONAL FEATURES OF IMPOUNDMENTS** BURFACE AREA TOTAL SUPFACE IMP. INFLOW IMP. NO. PURPOSE AĢĒ IN USE YRS OPEN LAST YR. YR, OF RECORD (YR) AREA (ACRES) (GALL/DAY) IN OP. (ACRES) DITAGIXONIA YFS 0 2.45 23,32 WST ST DRA n YES 0 2.45 23.32 ٥ ST OPA WST n YFS 0 0 2.45 23.32 0 0 3.83 WST ST ORA 0 YES n 23.32 0 MST ST OFA n Ð 0 YES ٥ 9,55 23,32 NST ST OPA YF S Û 2.48 23.32 IMP.EFFLHENT YR.OF TOTAL AVE. EFF. LINER TYPE THICKNESS LIVESTOCK TOTAL AVE. INFLOW YR. OF LIVESTOCK (GALL/DAY) PECOPD (GALL/DAY) PECORD (II CHES) NUMBER TYPE (GALL/DAY) 1974 610000 619000 0 NONE A70000 NONE 870000 ñ Α а n NONE fı 870000 n ũ 0 NONE 870000 41 Û 0 NONE 870000 NONE **GROUNDWATER CONTAMINATION POTENTIAL** **GROUNDWATER MONITORING** GROWNOWATER ON CHANGES DELVE WATER + UNST Gw AVL Gr GLT WAST HEAD OVERALL OF HEALTH MISC WAST RATING CON WELLS SAMPLE FARE FPON ANAL. CHAL CHANGS**RTMGRCCM RATING CON RATING CON CONTAM POT HZRD 10 ID NO ** 50 O MONE UNKY 54 68 5506 n MOME UNKN ** 50 54 23 68 EOF 9065 0 HONE UNKN ** 50 Δ 54 Δ Δ is 23 68 Ð EDF 2206 0 NONE Ditte 1 ** 50 54 23 EOF 5506 68 B 0 MINE Hittie 4 ** 50 Δ 5A Δ 23 66 ь EDF 5206 Sec. 1 46 HHEN. ** 50 54 EDF 5506

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STATE TO HO. LATITUDE 40049M258 LONGITUDE 111D55H388 OWNERS OPERATORS CHEVHOR USA INCOMPORATED CHEVRON USA INCOPPOPATED PC eOx 25117 2351 HORTH 1100 WEST SALT LAKE CTTY SALT LAKE CITY UT 84125 UT 84116 **FACILITY IDENTIFICATION** CATEGORY SIA SITE NO. IMPNOMNTS PLACE NEDES NO. SIC CODE SALT LAKE SALT LAKE CITY IND 3 490060175 2911 **OPERATIONAL FEATURES OF IMPOUNDMENTS** YPS OPEN LAST YR. IMP. NO. PHPPUSE AGF IN USE SURFACE AREA TOTAL SUPFACE IMP. INFLOW VR.OF RECORD (YR) IN OP. (ACRES) AREA (ACRES) (GALL/DAY) YES TERTIARY 15 ñ 6.37 15.88 1400000 1977 TERTIARY 15 YES 15 1400000 0 5.17 15.88 1977 TEPTIARY 15 YES 15 4.34 15.88 1400000 1977 IMP.FFFLUENT YP.OF TOTAL AVE. INFLOW YR. OF TOTAL AVE. EFF. LINER TYPE THICKNESS LIVESTOCK LIVESTOCK (GALL/DAY) PECOPU (GALL/DAY) RECORD (GALL/DAY) (INCHES) NUMBER TYPE 1400000 1977 1400000 1977 930000 NAME 1400000 1977 1400000 1977 930000 NONE 1977 1400000 14000000 1977 930000 NONE **GROUNDWATER MONITORING** **GROUNDWATER CONTAMINATION POTENTIAL ** GROUNDWATER GW CHANGES OF INK WATER # KUNST G# QLT HAST HZPD DVERALL GN HEALTH G= AVL MISC WAST WELLS SAMPLE FIFO FHOM ANAL. QUAL CHANGS**RTMGSCGM RATING CON RATING CON RATING CON CONTAM POT HIRD CON ID ID ND 0 UNKN ** 4C A SA 8 NONF 5 55 4C £ 2206 A 0 NONE HNKN ** 4C 54 55 4C 5500 ٥ NONE UNKN ** 40 54 52 4C 2206 SURFACE IMPOUNDMENT ASSESSMENT (SIA) **LOCATION OF ASSESSMENT** STATE ID NO. LATITUDE D M S LONGITUDE OWNERS PARNELLS PACKING LGPPANY INCORPORATED PARNELLS PACKING COMPANY INCORPORATED LAKETOHN LAKETOWN UT HARSA UT 84038 **FACILITY IDENTIFICATION** RPDES NO. SIC CODE CHTYVCTTY PLACE CATEGORY SIA SITE NO. IMPADMENTS 1900 HICH LAKETONN IND 24 201 **OPFRATIONAL FEATURES OF IMPOUNDMENTS** LAST YR. SURFACE AREA TOTAL SURFACE THP. THELOW YR.OF RECORD THP. NO. PURPOSE AGF In use YPS PIPEN IN OF. (ACRES) ARFA (ACHFS.) (GALL/PAY) (44) 9.60 ST DI SET YFS n 0.00 LIVESTOCK LIVESTOCK THE FEELINGST YEAR TOTAL AVE. THELON YROR TOTAL AVE. EFF. LINER TYPE THICK-CSS NUMBER (15CHFS) (GALIZOAY) PECOPE (GALL IDAY) PECOND (GALLIDAY) 15 1.1714 **GROUNDWATER CONTAMINATION POTENTIAL ** **GROUSOWATER MONTERPRINC** GA GLT MAST MENT SVI PALL ON HEALTH FISC MAST NO. GEOMERATER OF CHANGES DRINK MATERIALIST G. AvL WELLS STORTE ENERG FOR A BALL GUAL CHAISS**FILGECON PATING CON PATING CON HATING CON CONTAR POT HIRD CON TO ነር ላቦ

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YFS ** 40 4 30 A 5 A 5 A 17

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LATITUDE 40052H218 LONGITUDE 111055H218 STATE ID NO. 011054 OPPLATORS OWNERS CARTROU FOUR CORNERS CAPIBOD FOOR COFNERS 1431 SOUTH 1800 WEST 1431 SOUTH 1800 WEST WOODS CROSS WOODS CRUSS UT AGORT UT AUDAT **FACILITY IDENTIFICATION** CATEGORY SIA SITE NO. IMPNOMNTS NECES NO. SIC CODE CHTY/FITY PLACE 4900000655 PAVIS IND 1195 **OPERATIONAL FEATURES OF IMPOUNDMENTS** SURFACE AREA TOTAL SUPFACE IMP. INFLOR YF. OF RECORD LAST YR. IMP. NO. PURPOSE AGF IN USE (ACRES) AREA (ACRES) (GALL/DAY) (YR) IN OP. 1976 1977 0.92 2.76 35000 MO 2.76 1977 0 0 40 0 0.92 2 1977 2.76 ٨ 0 NO 0.92 3 LINER TYPE THICKNESS LIVESTOCK LIVESTOCK IMP FFFLUENT YR. OF TOTAL AVE. INFLOR YR.OF TOTAL AVE. EFF. (GALL/DAY) (INCHES) TYPE HECORD (GALL/DAY) RECORD (GALL/DAY) n 35000 Û NONE 35000 NONE 0 4) n n 0 35000 O NONE **GROUNDWATER CONTAMINATION POTENTIAL ** **GROUNDWATER MONITORING** GROUNDWATER GW CHANGES DRINK WATER ** UNST GM GLT WAST HIRD OVERALL GN HEALTH TEAR GW AVL HZRD CON FROM ANAL. QUAL CHANGS + RING &CON RATING CON RATING CON CONTAK POT 10 TO NO WELLS SAMPLE FFED UNKN ** SC A 54 23 68 8 E 5506 NONE á 0 23 68 8 F 2206 UNKN ** 50 NONE ô 23 6B 9055 NONE UNKN ** 50 SUPFACE IMPOUNDMENT ASSESSMENT (BIA) **LOCATION OF ASSESSMENT** STATE ID NO. UTIO54 LATITUDE 40050H088 LONGITUDE 111055H228 DENERS DEFRATORS HUSKY DIL COMPANY OF DELAWARE HUBKY DIL COMPANY PO 80X 175 4040 FAST LOUISIANA AVENUE DENVER NORTH SALT LAKE CO 80222 UT 84054 **FACILITY IDENTIFICATION** CNTY/CITY PLACE CATEGORY SIA SITE NO. IMPNOMNTS NPDES NO. SIC CODE NORTH SALT LAKE IND 490000027 2911 DAVIS 3 10 **OPERATIONAL FEATURES OF IMPOUNDMENTS** BURFACE AREA TOTAL SURFACE IMP. INFLOR PURPOSE IN USE YPS OPEN LAST YR. YR.OF RECORD THE. NO. AGE (ACRES) AREA (ACHES) (GALL/DAY) (YF) IN OP. SECOMBARY YF S 0 0.78 2.45 n 0 SECONDARY YF5 5 Θ 0.78 2.45 SECONDARY YF S 5 0 0.89 2,45 n LINEP TYPE IMP FFFLUENT YR . OF TOTAL AVE. INFLOS YR.OF TOTAL AVE. FFF. THICKNESS LIVESTOCK LIVESTOCK (ILALL /DAY) RECORD (GALL/DAY) RECOPD (GALL/DAY) (INCHES) NUMBER TYPE 0 a 0 240000 NONE 240000 NONE 240000 NONE fs n **GROUNDWATER CONTAMINATION POTENTIAL** **SPOUNDWATER MONITORING** NO. GROUNDWATER GH CHANGES DELINE WATERSHUNST SN AVL GW OLT WAST HIRD OVERALL ON HEALTH WAST FPOH ANAL. QUAL THANGS**HTNG&CON RATING CON PATING CON WELLS SAMPLE FAFE RATING COM CONTAM POT MZRD CON ΙO ID NO 6 NONE Expy # fu 1101 N 4 45 2 54 ٨ 5 55 5 A £ 5506 n

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OWNER		<u>.</u>						OPERATOR:		_		
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	IPMINGHAM							PROVO				
AL	1 35213							UT 84				
			CNTY/E1TY		. =		**FACILITY			LODER LO	*** ***	
			LNITZELII Utah	Y PLAC Provo			DRY SIA SI		-	NPDES NO.	SIC CODE	
			UIAN	PROVU		14D ++0PE	RATIONAL FEA	.1 Tures of I	4 YPOUNDHEN	0 T\$**	3321	
1	IMP. NO.	PURPOSE	AGE	IN USE	YR:	S OPEN	LAST YR.	SURFACE A	REA TOTAL	SURFACE	IMP. INFLOW	YR.OF RECORD
			(YP)				IN OP.	(ACRES)	AREA	(ACHES)	(GALL/DAY)	
	i		7	YE8		7	. 0	1,12		9.39	350000	1978
	2		7	YFS		7	ß	3.67		9.30	380000	1978
	3		7	YFS		7	Ó	2,30		9,30	380000	1978
	4		7	YES		7	0	2.30		9.39	360000	1978
	IMP.EFFLHE			AL AVE. IN	FLOW	YP.OF	TOTAL AVE.		INER TYPE	THICKNESS		LIVESTOCK
	(GALL/DAY)			GALL/DAY)		RECORD	(GALL/DAY			(INCHES)	NUMBER	TYPE
	380000	1975		380000		1978	380000		NONE	0		
	380000	1978		380000		1978	380000		NONE	0		
	380000	1978		380000		1978	380000		NONE	0		
	380000			380000		1978	380000		NONE	0		
		DMATER HO									ATTON POTENTIA	
	GROUNDHAT			DRINK WATE			GH AVL	GH OLT	MAST H		ALL GH HEALTH	
_	SAMPLE FRI	-	H ANAL.	QUAL CHANG						S CON CONT	-	CON ID ID N
!	MONTHL		40	NO	** 4		5A A	•	. 2	**	16 3C	8 0 1100
1	MONTHE		VO.	NO	**		5A A	5			16 3C	8 0 1100
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1	HUNIHE	* ^	łu	NU	**	-	5A A	5	A 2	•	16 3c	8 P 1100
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TATE INNER:	ID NO.		4 L/	ATITUDE 0	4D40H	015	LONGITUDE 1					
	TAUFFER CH							UPERATORS				
		FMTCAL CI	3m= # m 1							CAL COMPANY		
wŁ	ESTPORT	FMTCAL CI	J A					STAUF PO BO	FER CHEMI K 25893 Lake City	CAL COMPANY		
		FMTCAL CI)*************************************					STAUF PO BOI SALT UT 84	K 25893 Lake CITY 125	CAL COMPANY		
	ESTPORT						**FACILITY	STAUF PO BOS SALT UT 84 IDENTIFICA	K 25893 Lake City 125 Tion**			
	ESTPORT	ſ	DMT Y/CIT Y				ORY SIA SIT	STAUF PO BO SALT UT 84 IDENTIFICA E NO. IMP	K 25893 Lake City 125 Tion** Nomnts	NPDES NO.	STC CODE	
	ESTPORT	ſ	DMT Y/CIT Y	Y PLAI Salt Laki		Y IND	ORY SIA SIT	STAUF PO BO SALT UT 84 IDENTIFICA E NO. IMP	K 25843 Lake CITY 125 Tion** Nomnts 2	NPDES NO.		
Ċ1	ESTPORT	ſ	DMT Y/CIT Y		E CIT	Y IND	ORY \$14 5]7 1	STAUF PO BO SALT UT 84 IDENTIFICA E NO. IMP	K 25893 LAKE CITY 125 TION** NDMNTS 2 POUNDMEN REA TOTAL	NPDES NO. 900064772 1 5 ** L Surface	SIC COOE 8744 IMP, INFLOR	YR.OF RECORD
C1	ESTPORT T samo	(S≜t	CNTY/CITY	SALT LAK	E CIT	Y IND **0PE	ORY SIA SIT I Rational Fea	STAUFI PO BOS SALT I UT 84 IDENTIFICA E NO. IMPI 3	K 25893 LAKE CITY 125 TION** NDMNTS 2 POUNDMEN REA TOTAL	NPDES NO. 900064772 1 5 **	SIC COOE 8744	YR.OF RECORD
C1	ESTPORT T 68PA	(S≜t	ONTY/CITY LT LAKE AGF (YF)	SALT LAK	E CIT	Y IND **0PE	ORY SIA SII I Rational fea Last yr.	STAUFI PO BO SALT I UT 84 IDENTIFICA E NO. IMPI 3 TURES OF II SURFACE AL (ACRES)	X 25893 LAKE CITY 125 TION** NOMNIS 2 POUNDMEN REA TOTAL	NPDES NO. 900064772 1 5 ** L Surface	SIC COOE 8744 IMP, INFLOR	YR.OF RECORD
C1	ESTPORT T 68P0 IMP. NO. 1 4S) S ā ļ PZOGRUG	CNTY/CITY LT LAKE AGF (YF)	SALT LAKE	E CIT	Y IND **OPE	ORY SIA SIT I Rational Fea Last yr, In Op,	STAUFI PO 80' SALT I UT 84 IDENTIFICA E NO. IMPI 3 ITURES OF II	X 25893 LAKE CITY 125 TION** NOMNTS 2 POUNDMEN REA TOTAL	NPDES NO. 900064772 18** L SURFACF (ACRFS)	SIC CODE 8744 IMP, INFLOW (GALL/DAY)	
1	ESTPORT T 6880 IMP. NO. 1 45 2 CG	C SAL PURPOSE T DI SPO LLINGPONO NI YP.OF	DNTY/CIT) LT LAKE AGF (YH) 1 25 0 3	SALT LAKI IN HSE YES YES YES AL AVE, INI	E CIT	Y IND **OPE S OPEN 25 3 YP.OF	ORY SIA SIT RATIONAL FEA LAST YR. IN OP. O TOTAL AVE.	STAUF PO BO' SALT UT 84 IDENTIFICA' E NO. IMPI 3 ITURES OF II SURFACE AI (ACRES) 350.00 20.00	X 25893 LAME CITY 125 1100** NDMNTS 2 MPDUNDMEN REA TOTA AREA	NPDES NO. 900064772 15** (SURFACE (ACRES) 370.00 THICKNESS	STC CODE 8744 IMP, INFLOW (GALL/DAY) 1400000 11500000 LIVESTOCK	1979 1979 Livestock
1	ESTPORT T 6880 IMP. NO. 1 4S P CC IMP.FFF[UF	C SAL PUPPOSE T DI SPE LLINGPONE NI YP.OF RECOF	CNTY/CITY LT LAKE AGF (YE) 1 25 1 3 F TOTA	SALT LAKE IN HSE YES YES YES AL AVE. ING GALL/DAY)	E CIT	Y IND **OPEN S DPEN 25 3 YP.OF FECORD	ORY SIA SIT RATIONAL FEA LAST YR. IN OP. O TOTAL AVE. (GALL/DAY	STAUF PO 80: SALT UT 84 IDENTIFICA E NO. IMPI 3 TURES OF II SURFACE AI (ACRES) 350.00 20.00	X 25893 LAKE CITY 125 TION** NOMNTS POUNDMEN REA TOTAL AREA	NPDES NO. 900064772 75** L SURFACF (ACRFS) 376,00 Thickness (Inches)	STC CODE 8744 IMP, INFLOW (GALL/DAY) 1400000 11500000 LIVESTOCK	1979 1979
1	ESTPORT T 6880 IMP. NO. 1 45 2 CG	SAL SAL SAL T DI SPI LINGPOM LINGPOM TAL 1970 SAL SAL SAL SAL SAL SAL SAL SAL SAL SAL	AGF (YH) 1 25 0 3 F TOTA	SALT LAKI IN HSE YES YFS AL AVF, INI GALL/DAY) 12900000	E CIT	Y IND ++OPE S OPEN 25 3 YP.OF FECORD 1979	ORY SIA SIT RATIONAL FEA LAST YR. IN OP. O TOTAL AVE. (GALL/DA)	STAUF PO 80 SALT UT 84 IDENTIFICA E NO. IMPI 3 SURFACE A (ACRES) 350.00 20.00	X 25893 LAKE CITY 125 TION** NONTS POUNDMEN REA TOTA AREA INER TYPE	NPDES NO. 900064772 15** (SURFACE (ACRES) 370.00 THICKNESS	STC CODE 8744 IMP, INFLOW (GALL/DAY) 1400000 11500000 LIVESTOCK	1979 1979 Livestock
1	ESTPORT Y 6886 IMP. NO. 1 4S 2 CG IMP.EFFEUF (GALL/DAY) 6	SAL SAL PURPOSE T DI SPO L LINGPOM NI YP.OF RECON 1970	ONTY/CITY LT LAKE AGF (YA) n 25 n 25 n 3 F TOTA	SALT LAKE IN USE YES YES YES AL AVF. INI GALL/DAY) 12900000	E CIT	Y IND **OPEN S DPEN 25 3 YP.OF FECORD	ORY SIA SIT RATIONAL FEA LAST YR. IN OP. O TOTAL AVE. (GALL/DAY	STAUF PO BOS SALT UT 84 IDENTIFICA E NO. IMPI 3 TURES OF II SURFACE A (ACRES) 350,00 20,00	X 25893 LAKE CITY 125 TION## NDMNTS 2 PODUNDMEN REA TOTAL AREA INE# TYPF NONE NONE	NPDES NO. 900064772 15** L SURFACE (4CRF5) 370.00 THICKNESS (INCRES)	STC CODE 8744 IMP, INFLOW (GALL/DAY) 1400000 11500000 LIVESTOCK NUMBER	1979 1979 Livestock Type
1	ESTPORT T 6880 IMP. NO. 1 4S 2 CG IMP. FFFI UF (GALL/DAY) 6 **GROUN	SAL SAL PURPOSE T DI SPO LLINGPONO NT YP.OF RECOR 1970 1970 1970 NATES ME	CNTY/CITY LT LAME AGF (YA) 1 25 1 3 F TOTA RO (1) 9	SALT LAKE IN USE YES YFS AL AVF. INI GALL/DAY) 12900000	E CIT' YR! FLO≃	Y IND ++OPE S DPEN 25 3 YP.OF PECOHD 1979	ORY SIA SIT RATIONAL FEA LAST YR. IN OP. O TOTAL AVE. (GALL/DAY	STAUF PO 80: SALT UT 84 IDENTIFICA E NO. IMP 3 TURES OF II SURFACE A (ACRES) 350.00 20.00	X 25893 LAKE CITY 125 1100** NDMNTS 2 PDUINDMEN REA TOTAL AREA INER TYPE NOME NOME GROUNDMAT	NPDES NO. 900064772 15** L SURFACE (ACRES) 370,00 THICKNESS (INCHES)	STC CODE 8744 IMP, INFLOW (GALL/DAY) 1400000 11500000 LIVESTOCK NUMBER	1979 1979 LIVESTOCK TYPE
C1	ESTPORT Y 6886 IMP. NO. 1 4S P. CC IMP. FFF1 DF G ALL/DAY) G A*GROUN GFOUND,AT	SAL SAL PUPPOSE T DI SPE LLINGPONE RECOR 1976 1976 RNATE MA	AGF (YH) T 25 T 3 F TOTA RO (19 PRO 19 PRO 1	SALT LAKE IN USE YES YFS AL AVF. INI GALL/DAY) 12900000 12900000 G## URINK WATE	E CIT YR: FLO» ER**UI	Y IND **OPEN S DPEN 25 3 YP.OF PECORD 1979 1979	ORY SIA SIT RATIONAL FEA LAST YR. IN OP. O TOTAL AVE. (GALL/DA) GW AVL	STAUF PO 80 SALT UT 84 IDENTIFICA IN IMPI SURFACE A (ACRES) 350.00 20.00	X 25893 LAKE CITY 125 TION** NOMNTS POUNDMEN REA TOTA AREA INER TYPE NOME NOME GROUNDWATT WAST H	NPDES NO. 900064772 15** L SURFACE (ACRES) 370.00 THICKNESS (INCHES) 0 ER CONTAINA	STC CODE 8744 IMP, INFLOW (GALL/DAY) 1400000 11500000 LIVESTOCK NUMBER ATTON POTENTIA ALL GW +FALT+	1979 1979 LIVESTOCK TYPE
C1	ESTPORT Y 6886 IMP. NO. 1 4S 2 CG IMP.FFFFLUF (GALL/Day) 6 **eGROUN GROUND_AT SAMPLE FR	C SAL SAL PUPPOSE T DI SPO LLINGPOM NT YP.OF RECOR 1970 1970 NATER ME FR GM G FR FP GM G	CNTY/CITY AGF (YA) 1 25 2 3 F TOTA RO (19 9 10 11 10 10 10 10 10 10 1	SALT LAKE IN USE YES YES AL AVF. INI GALL/DAY) 12900000 12900000 G## GHINK WATI	E CIT VR: FLOW ER**UI GS**F	Y IND **OPEN S OPEN 25 3 YR.OF FECOHD 1979 1979 NST TNG&CCN	ORY SIA SIT RATIONAL FEA LAST YR. IN OP. O TOTAL AVE. (GALL/DAY CATTING COM	STAUF PO 80: SALT UT 84 IDENTIFICA- E NO. IMPI 3 TURES OF II SURFACE AI (ACRES) 350.00 20.00 EFF. L	X 25893 LAKE CITY 125 TIONAA NOMNIS APPOUNDMEN REA TOTA AREA INER TYPE NOME NOME GROUNDWAT WAST H DN RSTIN	NPDES NO. 900064772 15** L SURFACE (ACRES) 370,00 THICKNESS (INCHES)	SIC CODE 8744 IMP, INFLOW (GALL/DAY) 1400000 11500000 LIVESTOCK NUMBER ATTON POTENTIA ALL GW FFALTH AM POT HZPD	1979 1979 LIVESTOCK TYPE LIVESTOCK TYPE
C1	ESTPORT Y 6886 IMP. NO. 1 4S P. CC IMP. FFF1 DF G ALL/DAY) G A*GROUN GFOUND,AT	PURPOSE T DI SPE LLINGPONE RECOE 1970 1970 1970 1970 1970 1970 1970 1970	AGF (YH) T 25 T 3 F TOTA RO (19 PRO 19 PRO 1	SALT LAKE IN USE YES YFS AL AVF. INI GALL/DAY) 12900000 12900000 G## URINK WATE	E CIT YR: FLO» ER**UI	Y IND **OPEN S OPEN 25 3 YP.OF PECOHD 1979 NST ING&CCN 20	ORY SIA SIT RATIONAL FEA LAST YR. IN OP. O TOTAL AVE. (GALL/DA) GW AVL	STAUF PO 80: SALT UT 84 IDENTIFICATE NO. IMP 3 TURES OF II SURFACE AI (ACRES) 350.00 20.00 EFF. L GW GLT GW GLT	X 25893 LAKE CITY 125 TION** NOMNTS POUNDMEN REA TOTA AREA INER TYPE NOME NOME GROUNDWATT WAST H	NPDES NO. 900064772 15** L SURFACE (ACRES) 370.00 THICKNESS (INCHES) 0 ER CONTAINA	STC CODE 8744 IMP, INFLOW (GALL/DAY) 1400000 11500000 LIVESTOCK NUMBER ATTON POTENTIA ALL GW +FALT+	1979 1979 LIVESTOCK TYPE

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					R)				IN OP.		(ACRES		AREA	(ACRES)	(GALL/DAY)		
	:		BECONDA		5	YES		5	0		0.00			3.50	135000	1978	
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NO.	GRO	UNDE	O Undwatei Ater i	O HONIT HONIT	GES D	RINK WAT		BT	GH AVL		GW QLT	W	AST HZ	PD DYE	RALL GH HEALTH	H MISC	
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********************* **LOCATION OF ASSESSMENTER STATE 10 00. LATITUDE 41051MORS LONGITUDE 111053M155 0 M M E F E CACHE VALLEY DATRY ASSOCIATION CACHE VALLEY DAIRY ASSOCIATION SMITHFIFLD SMITHFIELD UT 84335 UT A4335 **FACILITY IDENTIFICATION** CNTY/CTTY PLACE CATEGORY SIA SITE NO. IMPNOMNTS MPDES NO. SIC CODE 490000264 CACHE 5055 ** OPERATIONAL FEATURES OF IMPOUNDMENTS** THP. NO. PURPOSE AGF IN USE LAST YR. SURFACE AREA TOTAL SUNFACE IMP. INFLOW AREA (ACHES) IN DP. (ACRES) (GALL/DAY) (YP) 901 PST ST OPA YES 140.00 1368000 0.00

MST ST ORA 1972 YES 140.00 1368000 Δ 0,00 WST ST GRA YES 140.00 1368000 1972 0.00 WST ST ORA YFS 1972 0.00 140,00 1368000 IMP. FFFLUENT YP. OF TOTAL AVE. INFLOW VP.OF TOTAL AVE. EFF. LINER TYPE THICKNESS LIVESTOCK LIVESTOCK PECORD RECORD (INCHES) (GALL/DAY) (GALL/DAY) (GALL/DAY) NUMBER TYPE 1368000 1972 CLAY 1368000 Λ 1972 CLAY 1366000 1472 NONE 1368000 1972 NONE **GROUNDWATER MONITORING** **GROUNDWATER CONTAMINATION POTENTIAL **

GPOUNDWATER GH CHANGES DRINK WATERWAUNST G# AVL GH QLT WAST HERD OVERALL ON HEALTH MISC WAST FROM ANAL. QUAL CHANGS ** FTNG CON PATING CON RATING CON RATING CON CONTAM POT WELLS SAMPLE FRED HIRD CON 10 ID NO ** 1E A 0 NONE UNKN 1 E 5 11 88 B €D 1702 • 1702 NONE UNKN 8 ** 1E 1 E 11 86 ED ** 16 0 NONE UNKN 1 # 11 1702 Ò NONE ** 1F UNKN 11 88 ΕD 1702 1 E

SURFACE IMPOUNDMENT ASSESSMENT (SIA)

LOCATION OF ASSESSMENT

STATE IU NO. UTJ103 LATITUDE 39037N37S LONGITUDE 111038M085 OWNERS

HORONI FEED COMPANY PROCESSING PLANT

204 SOUTH 100 EAST

MORONI UT 84646 OPERATOR=

MORONI FEED COMPANY PROCESSING PLANT

YR.OF RECORD

1972

204 SOUTH 100 EAST

MORONI

UT 84646

FACILITY IDENTIFICATION

CNTY/CITY PLACE CATEGORY SIA SITE NO. IMPNDMNTS NPDFS NO. SIC CODE SAN PETE HORONI IND 19 2016 **OPERATIONAL FEATURES OF IMPOUNDMENTS**

IMP. NO.	PHPPOSE	AGE IN USE	YPS DPEN	LAST YR.	SURFACE APEA	TOTAL SURFACE	IMP. INFLOW	YR.OF RECORD
		(YP)		IN OP.	(ACRES)	AREA (ACRES)	(GALL/DAY)	
1 #51	DT SPO	n YFS	n	n i	40.00	120.00	΄ 0	Ω
2 481	ST OFA	O YES	0	ď	40.00	120.00	0	0
	ST OFA	0 YES	0	n	40,00	120.00	0	0
IMP.FFFLIIF	T AB UE	TOTAL AVE. I	NELOW VE.OF	TOTAL AVE.	EFF. LINER	TYPE THICKNESS	LIVESTOCK	LIVESTOCK
(GALL/DAY)	8F C 0P 0	(GALL/DAY)	RECORD	(GALL/DAY)	(INCHES)	NUMBER	TYPE
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	##GROUND#A1	IFP HONTTOPIN	G##				* GRC	MINDWATER	LONI	TAMINATION P	CTENTIA	L**			
NEI.	GPOUNDMATER	GH CHANGES	URTNE WATER AND	NST	Gm AVL		GM ULT		MAST HZRI	j .	UVERALL G.	HEALTH		MISC	MAST
WFLLS	SAKELF FRED	FFOR ANAL.	GUAL CHANGS**R	THENCEN	RATING	CON	PATING	COM	RATING	CON	LENTAM POT	HZRD	CON	10	ID ND
O	NONF	tite K N	tinku **	16 4	54	A	5	٨	3	H	15	7.4	B		1700
Ð	tiOtiF	ERREICH	UNKN **	1F A	5 A	A	5	A	3	۾	15	7.4	8		1700
Ú	MINF	LINKH	Dick/4 **	1 F A	5 A	A	5	A	3	A	15	7.4	6		120

LOCATION OF ASSESSMENT STATE ID NO. UTJ043 LATITUDE 41043M045 LONGITUDE 111032M125 OHNERS OPERATORS IDEAL BASIC INDUSTRIES INCOPPORATED TOFAL CEMENT COMPANY DEVILE SLIDE IDEAL PLAZA 950 SEVENTEENTH STREET STAR ROUTE MORGAN DENVER 10506 03 UT 84050 **FACILITY TOENTIFICATION** CATEGORY SIA SITE NO. IMPNOMNTS CNTY/CITY PLACE NPDES NO. SIC COOF 490060159 MORGAN IND 20 1 3241 **OPERATIONAL FEATURES OF IMPOUNDMENTS** T4P. NO. PURPUSF AGE YRS OPEN LAST YR. BURFACE APEA TOTAL SURFACE IMP. INFLOW YR. OF RECORD IN USE IN OP. (YR) (ACRES) AREA (ACRES) (GALL/DAY) CONLING WAT 1978 NO 1975 0.00 0.00 160000 IMP. FFFLHENT YR. OF TOTAL AVE. INFLOR YR.OF TOTAL AVE. EFF. LINFR TYPE THICKNESS LIVESTOCK LIVESTOCK RECORD (GALL/DAY) RECORD (GALL/DAY) (GALL/DAY) (INCHES) NUMBER TYPE 1978 1978 160000 160000 160000 NONE **GROUNDWATER MONITORING** **GROUNDWATER CONTAMINATION POTENTIAL** NO. GHOUNDWATER GW CHANGES DRINK WATER**UNST Gm AVL GH OLT WAST HEAD OVERALL GH HEALTH WELLS SAMPLE FREG FROM ANAL. QUAL CHANGS**RINGECON RATING CON RATING CON CONTAM POT HZRD CON ID 6 None unkn unkn ** 3D a 4C a 5 a 1 6 13 68 B D ID NO

1600

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NONE

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OWNERS									• • • • • • • • • • • • • • • • • • • •		OPERATO	? =					
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			1515 A								P0 1	87 XOF	7	-			
DENV	FA										81. A1	DING					
C0 8	10505										UT :	94511					
									**FACIL	ITY I	DENTIFI	MOTTAS	**				
			CN.	TY/CITY		PLACE	:	CATE	ORY SIA	SITE	NO. 1	HPNDHN	18	NPDES NO.	SIC CODE		
			SAN	JUAN	BL ANI	DING		141)	22	!	3		0	1094		
								**0PE	RATIONAL	FEAT	URES OF	IMPOU	NOMENT	5 * *			
1 40	NO.	PI	PPOSE	AGE	Tre s	UBF	YP:	SOPEN	LAST Y	я.	SURFACE	AREA	TOTAL	SURFACE	IMP. INFLOW	YP.OF RECOR	10
				(YP)					IN OP.	-	(ACRES			(ACRES)	(GALL/DAY)		
	1	BACL 2		` 1	YES			1	0		0.0			0.21	40000	1978	
		HACES		1	YES			1	0		0.0			0.21	40000	1978	
		BACL 2		1	YES			1	D		0.0			0,21	40000	1978	
IMP	.EFFL	HENT	YR.OF	TOTAL	AVE.	. INF	OW	YR.DF	TOTAL	AVE.	FFF.	1 THER	TYPE	THICKNESS	LIVESTOCK	LIVESTOCK	
-	LL/DA		PECOPD	_	LL/D	-		PECORE	_		-		•	(INCHES)		TYPE	
	400		1978	,		000		1978		0000		C	LAY	b			
	406		1978			000		1978		0000			LAY	6			
	400	0.0	1978		40	000		1976		0000			LAY	6			
	680	UNDWA'	TER HON	ITORING*	*									R CONTAMIN	ATION POTENTIA	L	
NO. GR				ANGES D		WATE	***!	181	GW AVL		GW QLT	*	AST HZ	RO OVER	ALL GH HEALTH	HISC	MAST
WELLS SA	MPLE	FRFQ							RATING	CON	RATING	CON	RATING	CON CONT	AM POT HERD	CON ID	ID N
ō	NON	ŧ .				NKN	**		54	A	5	A	7		21 28	8	2214
0	NON	E			Ú	NKN	**	4C A	54	A	5	A	7	В	21 28	8	2214

STATE TO NO. UTTOPS

LOCATION OF ASSESSMENT
LATITUDE 410388325 LONGITUDE 111051M015
OPERATOR=

AMERICAN COMPOSITIES

AMERICAN COMMODITIES 119 EAST 300 NORTH

	19 EAST			. 0		119 EAST 300 NORTH											
	YRUM							HYRUM									
u.	T 84319	,						UT 843 IDENTIFICAT									
				CHTY/CT	TY PLAC			TE NO. JMPN		NPDES NO.	SIC CODE						
				CACHE	HYRUM	IAO	0 4 1 9 1 P 1	23	7	0	2077						
				LAURT	n i k U ei		RATTONAL FE	ATURES OF IM	POHNOMEN'	**	£,						
						*****		MICHES OF SI	, 00110-1011								
	IMP. NO		PURPUS	F AGE	IN USE	YRS OPEN	LAST YR.	SURFACE AR	EA TOTAL	L SURFACE	14P. INFLOW	YR.OF RECO	RD				
	•			(YP)			IN OP.	(ACRES)	AREA	(ACRES)	(GALL/DAY)						
	1	ANA	FROBIC	14	YES	14	0	0.58		7.35	26000	1975					
	5	AER	OBIC	17	YES	17	0	0.66		7.35	10000	1975					
	3	AEP	0810	14	YES	14	0	1.21		7.35	8000	1975					
	4	BRT	NE	8	YE S	8	0	0,47		7.35	5000	1975					
	5	BFI	NF	8	YES	8	Ą	0,43		7.35	2000	1978					
	6		0810	>	YES	2	O	5.00		7.35	500	1978					
	7	ART	NE	5	YES	5	9	2.00		7.35	500	1978					
	IMP.FFF	HIEN	T YR.	oF to	TAL AVE. IN	LOW YR.OF	TOTAL AVE	E EFF . LI	NER TYPE	THICKNESS	LIVESTOCK	LIVESTOCK					
	(GALL/D		REC		(GALL/DAY)	RECORD				(INCHES)	NUMBER	TYPE					
		000	19		31000	1978		0	NONE	0			-				
		000	19	75	31000	1978		0	NONE	0							
		700	19	78	31001	1978		1 HYPA	LON SHEE	0							
	2	000	18	75	31000	1978		0	NONE	Ü							
		506	19		31000	1978		0	NONE	0							
		Ð	19		31000	1978		Ō	NONE	0							
	_	O	19		31000	1978		0	NONE	() * 0 - 001 * 41 * 71							
				MONITORI		**	A				NATION POTENTI		WAST				
NO.					DRINK HATE		GW AVL	GW GLT	WAST H	CON CON	RALL GW. HEALTI TAM POT - HZRD		ID NO				
	SAMPLE		0 5 10	OH MHAL.		SS*+PTNG&CCN		5 4	E S	6 CON COM		5 5	10 40				
0		NE			HNKN	** DE A	34 A			•	13 5a 13 54	9 5	1705				
Ų.		NE NE			nwku nwka	RR OF A	3A 4		3	7	13 54	A F	1705				
U	-	INF			UNKN	** OF A	34			7	13 5A	A F	1705				
۸		NF			NWK V	** DE A	34		. 5	Ā	13 54	B Ē	1705				
ň		NF			UNKN	** 0E A	31		5	Ã	13 5A	8 E	1705				
٨		NF			UNKN	** 0E #	34	. ś. i	Š	Ã	13 5A	ě Ē	1705				
•	140				Q11K-1				-		• •						

*ALDCATION OF ASSESSMENT**

STATE ID to. UTHIL4

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LATITUDE ON S LONGITUDE
 OWNERS
                                                               OPEPATOR#
    UTAH POWER AND LIGHT COMPANY
                                                                   UTAH POWER AND LIGHT HUNTINGTON PLANT
    4152 48 P68 KO9 Ud
                                                                   PO ROX 680
    SALT LAKE CITY
                                                                   HUNTINGTON
    UT #4110
                                                                   UT 84528
                                                    **FACILITY IDENTIFICATION**
                                              CATEGORY SIA SITE NO. IMPNOMNTS
                      CHTY/CITY
                                    PLACE
                                                                                  NEDES NO.
                                                                                                SIC CODE
                      EMERY
                                HUNTINGTON
                                                            24
                                                                                                 491
                                              **OPERATIONAL FEATURES OF IMPOUNDMENTS**
     IMP. NO. PUPPOSE
                                 IN USE
                                          YES OPEN
                                                   LAST YR. SURFACE AREA TOTAL SURFACE
                                                                                           IMP. INFLOW
                                                                                                         YR.OF RECORD
                        (YP)
                                                    IN OP.
                                                                (ACRES)
                                                                             AREA (ACPES)
                                                                                           (GALL/DAY)
                                                                  28.00
             EVAP PUND
                                 YES
                                                                                 47.75
                                                       a
                                                                                               58160
                                                                                                            197
             STP EFFI UFN
                                 YFS
                                                       ٥
                                                                   0.25
                                                                                 47.75
                                                                                                             0
             WST ST ORA
                                 YES
                                                                  2.50
                                                       0
                                                                                 47.75
                                                                                                             n
             RAL WATER
                                 YES
                                                                  17.00
                                                                                 47.75
                                                                                              517000
                                                                                                            197
     IMP. EFFLUENT YR. OF
                           TOTAL AVE. INFLOW
                                            YP.OF
                                                    TOTAL AVE. EFF. LINER TYPE THICKNESS
                                                                                              LIVESTOCK
                                                                                                         LIVESTOCK
     (GALL/DAY)
                   RECOPO
                             (GALL/DAY)
                                             RECORD
                                                     (GALL/DAY)
                                                                                   (INCHES)
                                                                                                            TYPE
                                               197
                                                                          NONE
                                                                                     201
                                               147
                                                                          NONE
                                                                                     100
                                               197
                                                                          NONE
                                                                                     201
                                               197
                                                                          NONE
                                                                                     240
        **GROUNDWATER MONITORING**
                                                                      **GROUNDWATER CONTAMINATION POTENTIAL **
     GROUNDWATER GH CHANGES DRINK MATER++UNST
                                                   GH AVL
                                                                          WAST HIRD OVERALL ON HEALTH
                                                                Gw QLT
                                                                                                             MISC WAST
 WELLS SAMPLE FREQ
                   FROM ANAL. GUAL CHANGS+ARTNG&CON RATING CON RATING CON RATING CON CONTAM POT
                                                                                                  HZRD CON
          NONE
                                  UNKN
                                        ** 9C B
                                                     5A .
                                                            8
                                                                                     A
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                                                                                                    68
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                                                                       A
                                                                                                                      0
          NONE
                                   UNKN
                                         ** 90
                                                 В
                                                     54
                                                            8
                                                                                           52
                                                                                                    68
                                                                                                           8
                                                                                                                      0
  0
          NONE
                                   UNKN
                                         ** 90
                                                 ö
                                                     54
                                                            В
                                                                                           55
                                                                                                    68
                                                                                                           8
                                                                                                                      0
  0
          NONE
                                   NO
                                         ** 90
                                            SURFACE IMPOUNDMENT ASSESSMENT (SIA)
                                            *****
                          **LOCATION OF ASSESSMENT**
STATE 10 NO. UTT 54
                            LATITUDE 40046M258 LONGITUDE 111055M245
OWNERS
                                                              OPERATOR=
    UTAH POMER AND LIGHT COMPANY
                                                                  UTAH POWER AND LIGHT GADSBY PLANT
    PO BOX 899 PH 2214
                                                                  REAR 1359 HEST NORTH TEMPLE
    SALT LAKE CITY
                                                                  SALT LAKE CITY
   UT 84110
                                                                  UT 84110
                                                   **FACILITY IDENTIFICATION**
                                    PLACE
                     CHTY/CITY
                                             CATEGORY SIA SITE NO. IMPNOMNTS
                                                                                 NPDES NO.
                                                                                              SIC CODE
                    SALT LAKE
                                               IND
                                                                                490000116
                                             ** OPERATIONAL FFATURES OF IMPOUNDMENTS **
    INP. NO.
              PURPOSE
                         AGE
                                IN USE
                                          YPS OPEN LAST YR. SURFACE AREA TOTAL SURFACE IMP. INFLOW YR.OF RECORD
                                                   IN OP.
                                                                           AREA (ACPES) (GALL/DAY)
                                                               (ACRES)
        1 WARTEMATER
                                YFS
                                                                  1,19
                                                                                 1.19
    IMP. FFFLUENT YF. OF
                          TOTAL AVE. INFLOW YR. OF TOTAL AVE. EFF.
                                                                     LINER TYPE THICKNESS
                                                                                             LIVESTOCK LIVESTOCK
    (GALL/DAY)
                  RECORD
                            (GALL/DAY)
                                            RECORD (GALL/DAY)
                                                                                  (INCHES)
                                                                                              NUMBER
                  1978
                                                       860000
                                                                         CLAY
                                                                                    12
        **GROUND*ATER MONITORING**
                                                                     **GROUNDWATER CONTARTNATION POTENTIAL**
NO. GROUNDLATER GR CHANGES DRINK HATERWEUNST
                                                  G* AVL
                                                               GH OLT WAST HIPD OVERALL ON HEALTH
WELLS SAMPLE FORG FOOM ANAL. BUAL CHANGS+ARTNG&CON RATING CON RATING CON RATING CON CONTAM POT HERD CON ID
                                                                                                             MISC WAST
                                                                                                                  ID NO
        NOME
                                 UNKY ** 4C A 5A A
                                                               5 4
                                                                           5
                                                                                   P 19
                                                                                                   48
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					**L(CATION O	F ASS	ESSMENT	**										
STATE	TO NO.				LA	TITUDE	£.	M S	LONGITU	₽€	D M	9							
OWNER	=										OPERATO	P ==							
E	A MTL	LFR A	NP \$01	S P	ACKING	CUMPANY					EA	MILL	ER AND	SONS FACE	ING COM	PANY			
4	10 NORT	TH 20	0 WES!	r							410	NORT	LH 500 H	NES1					
H	YF'UK										HABI	JM							
U	T 6431	9									üτ	84314	,						
									* A F A C I	LITY :	IDENTIFI	CATIO	? * **						
				6 67	!v/c! Tv		ACE	CATE	GORY SI	A SITE	F NO. 11	4PND+	1015	NPDES NO	. 5	IC CODE			
				CAC	HF	HYRUM		I٨		20		5		0		2011			
								**DF	ERATIONA	L FEAT	TUPES OF	IMPO	JUNDHEN1	75±*					
	IPP. NO	0.	PUPPOS	SF	AGF	IN USE	Y	RS OFER	LAST	YP.	SURFACE	AREA	TOTAL	L SUPFACE	IMP.	INFLOW	YR.OF	RECOR	in.
	_	-	•		(YP)				IN OP.		(ACRES			(ACHES)	(GALL/				•
	1	¥ST	01 5		ົດ໌	YES		Ð	0		0.0			0.00	(0.00)	0		6	
	ż	*6T		SPO	n	YE8		9	0		0.0			0.00		ō		ō	
	3	* 5 T	01 3	PO	9	YES		0	0		0.0			0.00		0		0	
	B	*ST	DIS	300	Ü	YES		0	0		0.0	3		0.00		٥		0	
	5	¥ST	01 8	PO	n	YFS	•	n	ð		0.0	n		0.00		0		0	
	IMP.EFF	FLUEN	T YP.	OF	7074	M. AVE. I	NELOW	YR.DF	TOTAL	AVE.	EFF.	LINE	R TYPE	THICKNES	8 LI	VESTOCK	LIVE	STDCK	
	(GALL/	DAY	REC	080	16	SALL/DAY)	-	PECOR		L/DAY		•		(INCHES		UMBER		YPE	
		Ô		0	-	0				0	•		NONE	0	-			• • •	
		0		Ð		0		n		0			NONE	0					
		0		0		0		ð		0			NONE	U					
		0		n		9		0		0			NONE	v					
		0		Ð		a		0		0			NONE	Ů					
					ITORING							**GP(EP CONTAMI					
NO.						DHINK MA			GH AVL		G# QLT		HAST H		RALL GW			MISC	MAST
HELLS	SAMPLE		u te	OH W	INAL.	QUAL CHA				CON	RATING	CON	RATING	CDH CUN		•		10	ID NO
o.		ONF				YES		94 4	30	A	5	A	5	A	55	3.4	В		1705
0		DNE				YES		9A A	30	A	5	A	5	A	22	3.4	8		1705
0		ONE				YES		9 A A	. <u>3</u> c	A	5	A	5	A	55	34	8		1705
0		ONF				YES		QA A	30		5	A	5	A	55	34	6		1705
0	M	ONE				YES	**	94 4	30	A	5	A	5	Δ	55	3.4	8		1705

SURFACE IMPOUNDMENT ASSESSMENT (SIA) **************

STATE ID NO. UTTOZZ OWNERS

LOCATION OF ASSESSMENT LATITUDE 410458565 LONGITUDE 111051838 OPERATOR

GOSSNER CHEERF 1000 WEST 1000 NORTH GOSSNER CHEESE 1000 WEST 1000 NORTH LOGAN LOGAN 15 E49 TU

UT 84321

FACILITY IDENTIFICATION
CATEGORY SIA SITE NO. IMPNOMNTS CNTY/CITY PLACE NPDES NO. SIC CODE CACHE LOGAN IND 0 **OPERATIONAL FEATURES OF IMPOUNDMENTS**

	IMP. NO. PU	PPOSE AGE	IN UBE Y	RS OPEN	LAST YR. IN OP.	SURFACE		STAL SUPFACE	IMP. INFLOW	YR.OF RECOR	D
	10	0	60	0	1975	0.0	0	90.0	0	0	
	,	0	NO	0	1975	0.0		0.00	0	ò	
	3	0	NO	0	1975	0.0		0,00	ů.	0	
	IMP.FFFLUENT	YP.OF TO	TAL AVE. INFLOR	YR.OF	TOTAL AVE	F. EFF.	LINER TY	PE THICKNES	S LIVESTOCK	LIVESTOCK	
	(GALL /PAY)	FFCORD	(GALL/DAY)	PECOED	IGALL/0/	AY)		(Inches)	NUMPER	TYPE	
	0	n	ŋ	6		ŋ	NONE	1			
	۸	0	g	0		n	NON	41			
	0	n	-1	n		G	NONE				
	# # GROUND NA	TER MONITORI	NG++				**GKOUND	ATER COLIANI	NATION POTENTIA	£**	
NO.	GPOUNDWATER	GM CHANGES	DRINK HATERASI	UNST	Gw AVL	G# GLT	*AS1	THERE OVE	PALL GW HEALTH	PISC	w A S T
WELLS	SAMPLE FPFG	JANA MOGE	. GHAL CHANGS++1	PTNGRECK	RATING CO	DATTAR AC	COM RAT	LING CON CON	TAP POT HYRD	COM 10	ID NO
0	NONE		YFS **	5C A	5A /	4 5	A	4 4	19 48	8 F	1703
0	MGNF		YES **	5C A	54	4 5	A	L A	19 48	a E	1703
0	MONE		YF8 **	5C A	54	4 5	A	4 .	19 48	8 E	1703

LOCATION OF ASSESSMENT STATE 10 50. UTJ074 LATITUDE HODISHOS LONGITUDE 111044M508 OWNERS UNITED STATES STEEL CORP GENEVA MORKS UNITED STATES STEEL CORPORATION 600 GRANT STREET PO BOX 510 PITTSAURGH PPOVO UT 84601 PA 15230 **FACILITY IDENTIFICATION** CATEGORY SIA SITE NO. IMPNDMNTS CHTY/CITY PLACE NPDES NO. STC CODE UTAH OREM IND 28 490000361 3312 **OPERATIONAL FEATURES OF IMPOUNDMENTS** SURFACE AREA TOTAL SURFACE IMP. INFLOW YR. OF RECORD IMP. NO. PURPOSE AGE IN USE YRS DPEN LAST YR. AREA (ACPES) (ACRES) (YR) IN OP. (GALL/DAY) 357,30 1978 35 312,00 265000000 COOLING YES 35 0 1978 SECONDARY 10 YES 10 45.30 357,30 22000000 LINER TYPE THICKNESS LIVESTOCK LIVESTOCK IMP.EFFLUENT YR.DF TOTAL AVE. INFLOW YR.OF TOTAL AVE. EFF. (GALL/DAY) PECORD (GALL/DAY) RECORD (GALL/DAY) (INCHES) NUMBER TYPE 1978 1978 265000000 287000000 10000001 120

22000000 1978 287000000 1978 9000000 NONE **GROUNDWATER HONTTORING** **GROUNDWATER CONTAMINATION POTENTIAL**
WAST HZRO OVERALL GW HEALTH GW GLT TEAM GROUNDWATER GW CHANGES DRINK HATERUNST GM AVL HISC MELLS SAMPLE FREG. FROM ANAL. GUAL CHANGS**RTNG&CON RATING CON RATING CON RATING CON CONTAM POT. HZRD. CON ID ID NO NONE NO ** 4C A 5 A 5 5 16 48 Ď 1100 NONE NO ** 4C 54 16 4B D 1100

YR. OF RECORD

MISC WAST

ID NO

5513

1979

28

LOCATION OF ASSESSMENT LATITUDE 400444228 LONGITUDE 1110564588 STATE TO NO. GTT 54 OWNERS THATCHER CHEMICAL COMPANY THATCHER CHEMICAL COMPANY PD BOX 6114 PO BOX 6114 BALT LAKE CITY SALT LAKE CITY UT 84106 UT 84106 **FACILITY IDENTIFICATION** NPDES NO. SIC CODE PLACE CATEGORY SIA SITE NO. IMPNDMNTS CHTY/CITY SALT LAKE SALT LAKE CITY IND 29 2841 **OPERATIONAL FEATURES OF IMPOUNDMENTS** PURPOSE AGE IN USE LAST YR. SURFACE AREA TOTAL SURFACE IMP. INFLOW TMP. NO. AREA (ACRES) (GALL/DAY) IN OP. (ACRES) 0,03 0.03 HSY DI SPO YF 8 LIVESTOCK LIVESTOCK TOTAL AVE. INFLOW YR.OF TOTAL AVE. EFF. LINER TYPE THICKNESS IMP. FFFLUENT YR. OF (INCHES) NUMBER RECORD (GALL/DAY) (GALL/DAY) RECORD (GALL/DAY) 1979 NONE **GROUNDWATER CONTAMINATION POTENTIAL ** **GROUNDWATER HONITORING** NO. GROUNDWATER GH CHANGES DRINK WATER**UNST GH GLT WAST HEAD OVERALL GR HEALTH GH AVL

INKN ** #D A 3C

SURFACE IMPOUNDMENT ASSESSMENT (SIA)

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A 17

************ **LOCATION OF ASSESSMENT** STATE IS NO. UTJ 84 LATITUDE MODIIMSES LONGITUDE 111037M458 OWNERR REILLY TAN AND CHEMICAL CORPORATION REILLY TAR AND CHEMICAL CORPORATION 151 NORTH DELAMARE STREET PO BOX 1186 INDIANAPOLIS

NONE

IN 46204

PROVO UT 84601 **FACILITY IDENTIFICATION**

MELLS SAMPLE FRED FROM ANAL. GUAL CHANGS + STING CON RATING CON RATING CON CONTAM POT MER CON 10

NPDES NO. SIC CODE CHTY/CTTY PLACE CATEGORY SIA SITE NO. IMPNDMNTS 490000370 295 UTAH PROVO IND 33 **GFERATIONAL FEATURES OF IMPOUNDMENTS**

	TMP. NO. PH	ppnsf i	AGF IN USE	1340 BRY	LAST YR.	SURFACE AREA	TOTAL SURFACE	IMP. INFLOW	YR.OF RECORD
		() (8 }		IN OP.	(ACRES)	AREA (ACHES)	(GALL/CAY)	
	1 (40)	46. 46	n YFS	40	6	0.02	0.06	300000	1978
	\$. ront 1	%6 n) YFS	40	n	0.04	0.00	322700	1978
	IMP FFFLHERT	4H_11F	TOTAL AVE. THE	10.9Y ×0.	TOTAL AVE.	EFF. LINER	TYPE THICKSES	SS LIVESTOCK	LIVESTOCK
	(GALL YOUT)	RECHAD	(GALL JOAY)	FFLUEN	IGALL/DAY)	(15 CHF)	S) NUMBER	TYPE
	300000	1974	6/266)	197£	692000		ONE		
	322001	1978	69889	1978	622000		ONE		
	* RENDUNDO A	TEX MOUTTO	CP Etyle ##			**GROU	NOWATER CONTAM	IKATION POTEKTIA	1 <u>1,</u> + <i>≠</i>
NEI .	CHE HOD WATER	Ge CHAIN	LES PULLE KATE	Perchall	Gn AVL	Gratt n	AST HZPD Duf	FWALE ON HFALTH	15C *AST
WFLIS	S SAUDLE SEE!	Fully 21	AL. OUAL CHANGE	8**FTFGRCLN	PATTAG CON	RATING COM	PATING COULD	TAR FOT HIRE	CON IC TO ME
6	1-17-5		6/A	** 45 4	54 A	5 A	5 4	19 30	5 L 2210
P	1.00€		/1	. 45 0	54 4	5 4	5 a	19 37	H 2210

** LOCATION OF ASSESSMENTS STATE ID NO. UTI 54 LATITUDE D M S LONGITUDE (IPERATORS OWNERS WESRECO INCORPONATED WESTERN REFINING COMPANY PO BOX 298 2305 WEST 1100 SOUTH WOODS CROSS WDODS CROSS UT 84087 UT SAGET **FACILITY IDENTIFICATION** CHTY/CITY PLACE CATEGORY SIA SITE NO. IMPNDMNTS NPDES NC. STC CODE 490000730 DAVIS 37 291 **OPERATIONAL FEATURES OF IMPOUNDMENTS** YPS OPEN SURFACE AREA TOTAL BUPFACE IMP. INFLOR IMP. NO. PUPPOSE AGF IN USE LAST YR. YP.OF RECORD (GALL/DAY) (YR) IN OP. (ACRES) AREA (ACRES) YFS 25 0.66 0.66 130000 TOTAL AVE. INFLOW YR.OF LINER TYPE THICKNESS LIVESTOCK LIVESTOCK IMP.EFFLUENT YR.OF TOTAL AVE. EFF. (GALL/DAY) (GALL/DAY) RECORD (GALL/DAY) RECORD (INCHES) NUMBER TYPE 130000 1974 130000 1978 130000 CLAY 18 **GROUNDWATER MONITORING** **GROUNDWATER CONTAMINATION POTENTIAL** GPOUNDWATER GH CHANGES DRINK WATER ** UNST GW AVL WAST HERD OVERALL GW HEALTH MISC WAST GH QLT FROM ANAL. QUAL CHANGS+ARTNG&CON RATING CON RATING CON RATING CON CONTAM POT WELLS SAMPLE FREQ HIRD CON 10 ID NO NONE NO ** 50 A 54 A 5 A 5 9 20 34 8 ٥ E 2005 SURFACE IMPOUNDMENT ABSESSMENT (SIA) **LOCATION OF ASSESSMENT** STATE ID NO. UTT134 LATITUDE 35050M218 LONGITUDE 111057M438 OWNER . OPERATOR= GEORGIA PACTFIC CORPOPATION GEORGIA PACIFIC CORPORATION SIGURD UT 84657 **FACILITY IDENTIFICATION** CATEGORY SIA SITE NO. IMPNDMNTS CNTY/CITY PLACE NPDES NO. SIC CODE SEVIER IND 38 3275 **OPERATIONAL FEATURES OF IMPOUNDMENTS** IMP. NO. PURPOSE AGF IN USE YPS OPEN LAST YR. SURFACE ARFA TOTAL SUPFACE IMP. INFLOW YH. OF RECORD AREA (ACRES) (GALL/DAY) (YR) IN OP. (ACRES) 1 SETTLING 15 YFS 0.02 9.02 IMP.FFFLUFNT YR.OF TOTAL AVE. INFLOW YF. OF TOTAL AVE. EFF. LINER TYPE THICKNESS LIVESTOCK LIVESTOCK RECORD (GALL/DAY) (GALL/DAY) PECORD (GALL/DAY) (INCHES) NUMBER TYPE 0 **GROUNDWATER CONTAMINATION POTENTIAL ** **GROUNDWATER MONITORING** GPOUNDWATER GH CHANGES DETHE WATER . UNST GH AVE GH OLT WAST HEAD GYFFALL ON HEALTH

MELLS SAMPLE FREG. FROM ANAL. GUAL CHANGS ** TING CON RATING CON RATING CON RATING CON CONTAM POT HERD CON

5

UNKN ** 40 4 54 A

n

NONE

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86

HISC WAST

ID NO

1600

SURFACE IMPOUNDMENT ASSESSMENT (SIA) **********

LOCATION OF ASSESSMENT

STATE TO MO. UTTOSA LATITUDE D M S LONGITUDE OWNER= OPERATORS AMOCO OIL COMPANY AMOCO DIL COMPANY 474 WEST 900 NORTH SALT LAKE CITY 0 UT 84103 **FACILITY IDENTIFICATION** PLACE CATEGORY SIA SITE NO. IMPNDMNTS NPDES NO. SIC CODE SALT LAKE SALT LAKE CITY IND 39 2 2911 ** OPERATIONAL FEATURES OF IMPOUNDMENTS ** IMP. NO. PUPPOSE AGE IN USE YRS OPEN LAST YR. SURFACE AREA TOTAL SURFACE IMP. INFLOW YR. DF RECORD IN OP. (ACRES) AREA (ACRES) (GALL/DAY) (YP) ST ORA YES n 1.83 13.06 C KST ST HEA VF 8 13.08 11.25 TEP FFFLUENT YP.OF TOTAL AVE. INFLOW YR.OF TOTAL AVE. EFF. LINER TYPE THICKIASS LIVESTOCK LIVESTOCK (GALL/DAY) RECUPO (GALL/DAY) RECORD (GALL/DAY) (INCHES) NUMBER TYPE 0 NONE n NONE 0 **GROUNDWATER MONITORING** **GROUNDWATER CONTAMINATION POTENTIAL** GROUNDWATER GW CHANGES DRINK WATER++UNST Gw GLT WAST HIRD GVEHALL GW HEALTH G" AVL WELLS SAMPLE FRED FROM ANAL. QUAL CHANGS**HTNGKCUN MATING CON RATING CON BATING CON CO-14H POT HERD CON ID ID NO ** 4C A 48 NOHE YFS 54 Δ 5 8 55 Ε 2004 55 2004 NUNF YF8 ** 40 54 AR SUPFACE IMPOUNDMENT ASSESSMENT (SIA) ************************* **LOCATION OF ASSESSMENT** STATE TO MO. UTO102 LATITUDE 39032M308 LONGITUDE 110D23M208 OWNERS **DPERATOR** KAISER STEEL CORPORATION KAISER STEEL LORPOPATION PO BOY D PO ROX D SUNNYSTOF SUNNYSIDE UT 84539 UT 84539 **FACILITY IDENTIFICATION** CHITY/CITY PLACE CATEGORY SIA SITE NO. IMPNOMNTS NPDES NO. SIC CODE CARBON SUNNYSIDE 490022942 12 **OPERATIONAL FEATURES OF IMPOUNDMENTS** TMF. NO. PURPOSE TH USE YPS OPEN LAST YR. SURFACE AREA TOTAL SURFACE IMP. INFLOW YR.OF RECORD AHEA (ACPES) IYRY IN OP. (ACRES) (GALL/DAY) 1977 1977 WST DI SEO 30 N() 33,10 46.00 *ST PI SPO 46.00 22000 1978 YFS ٥ 5.80 WST DI SPO YES 3.10 46.00 64000 1978 WST DI SPO 1978 YES n 4.00 46.06 64466 IMP. FFFLUENT YP. OF TOTAL AVE. EFF. TOTAL AVE. INFLOW YR.OF LINER TYPE THICKNESS LIVESTOCK LIVESTOCK PECORD (GALL/DAY) RECORD (GALL/DAY) (JUCHES) NUMBER TYPE (GALL/DAY) 1977 150000 1978 NONE 1978 MONE 150000 1978 Ω 1978 150000 1978 HONF 1978 150000 1978 Ω MONE **GROUNCHATER MONITORING** **GROUNDWATER CONTAMINATION POTENTIAL** GPOHNDWATER G. CHANGES DRINK WATER + NINST WAST HERD OVERALL ON HEALTH Gm AVL GW GLT WELLS SAMPLE FRED FOOM ANAL. QUAL CHANGSHARTNGSCON RATING CON RATING CON RATING CON CONTAM POT T.D ID NO HZRD CON NONE HAKN ** 78 4 19 4 A 6 1600 0 8 34 Ė 5 • NONE HNKN ** 75 1600 ZΔ В • 19 46 MILLE UBIKA ** 7R 19 1600

34

ΔF

UNKN

** 7H

Mills F

6

19

1600

STATE ID ED. UTTG22 OWNER =

LATITUDE 41045#345 LONGITUDE 111048M528

DIAH STATE UNIVERSITY

UTAH STATE UNIVERSITY DAIRY FARM

LOGAN UT 84322 LOGAN UT 84322

CNTY/CTTY PLACE CACHE

LOCATION OF ASSESSMENT

FACILITY IDENTIFICATION CATEGORY SIA SITE NO. IMPNDMNTS NPDES NO. SIC CODE 24 ACR LOGAN **OPERATIONAL FEATURES OF IMPOUNDMENTS**

LAST YR. SURFACE AREA TOTAL BURFACE IMP, INFLOW YR.OF RECORD YRS DPEN IMP, NO. AGE IN USE AREA (ACRES) (GALL/DAY) (ACRES) IN DP. (YP) 0.10 0.10 SECONDARY YES

LIVESTOCK LIVESTOCK TOTAL AVE. INFLOW YR. OF TOTAL AVE. EFF. LINER TYPE THICKNESS IMP. FFFLUENT VR. OF TYPE RECORD (GALL/DAY) (INCHES) NUMBER (GALL/DAY) RECORD (GALL/DAY) CATTLE 300

GROUNDWATER CONTAMINATION POTENTIAL ** **GROUNDWATER MONITORING MISC WAST GROUNDWATER GN CHANGES DRINK WATER ** LINST GW AVL GR GLT WAST HEAD OVERALL GH HEALTH WELLS SAMPLE FREG FROM ANAL. GUAL CHANGS**RTNG&CON RATING CON RATING CON RATING CON CONTAM POT HERO CON ID ID NO 1702 UNKN ** 5C A 5E A 5 A 5

SURFACE IMPOUNDMENT ASSESSMENT (SIA)

LOCATION OF ASSESSMENT

LATITUDE D M & LONGITUDE

OPERATORE

EUGENE JENSFN

BILL MHAGCOTT

CENTEPFIELD UT

STATE ID NO.

OWNERS

CENTERFIELD UT 0

FACILITY IDENTIFICATION CNTY/CITY PLACE CATEGORY SIA SITE NO. IMPNDMNTS

NPDFS NO. STC CODE SAN PETE CENTERPIELD 24 **OPERATIONAL FEATURES OF IMPOUNDMENTS**

SURFACE AREA TOTAL SURFACE IMP. INFLOW YR. OF RECORD IMP. NO. IN USE YRS OPEN LAST YR. AREA (ACRES) (GALL/DAY) IN OP. (ACRES) (YR) HST PT SPO 60.00

LIVESTOCK LIVESTOCK IMP.FFFLUENT VP.OF TOTAL AVE. INFLOW YR.OF TOTAL AVE. EFF. LINER TYPE THICKNESS (INCHES) TYPE (GALL/DAY) PECOPO (GALL/DAY) PECOPD (GALL/DAY) CATTLE 1100

GROUNDWATER CONTAMINATION POTENTIAL ** **GROUNDWATER HONITOPING GROWNDWATER GH CHANGES PRINK WATER + LINST GW AVL GH GLT WAST HEAD OVERALL ON HEALTH HISC WAST WELLS RAMPLE PURD FURN ANAL. GUAL CHANGS++PTNGACCN RATING CON RATING CON CUNTAM POT HEAD CON ID TO NO ** 98 8 54 B 5 В 5 24 7 4 1705 2 SEMIAMMUALLY NO

SURFACE IMPOUNDMENT ASSESSMENT (STA) **LOCATION OF ASSESSMENT** LATITUDE GODSINETS LONGITUDE 112001M168 STATE ID NO. UTHIR63 DWNERE OPERATORS DICK FASSIO CHESTER FASATO 3664 SOUTH 5200 WEST 3664 SUUTH SZOO WEST SALT LAKE CITY SALT LAKE CITY UT 0 **FACILITY IDENTIFICATION** CNTY/CITY PLACE CATEGORY SIA SITE NO. IMPNOMNTS NPOES NO. SALT LAKE HERRIMAN AGR **OPERATIONAL FEATURES OF IMPOUNDMENTS** YRS OPEN LAST YR. SURFACE AREA TOTAL SURFACE IMP. INFLOW PURPASE AGE IN USE IMP, NO. (ACRES) AREA (ACRES) (GALL/DAY) IN OP. (YP) 200,00 YES 0.00 WST DI SPO UN 0.00 200.00 WST OT SPO 40 #O ٥ YES 500.00 WST DI SPO 40 YES 40 0 0,00 TOTAL AVE. EFF. LINER TYPE THICKNESS TOTAL AVE. INFLOW YR.OF IMP.FFFLUENT YR.OF

RECORD

0

(GALL/DAY)

MONE

RECORD

9

(GALL/DAY)

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	GROUNDHA!	FEP MONITORIN	G				**G			AMINATION P		. * *		
NO.	GROUNDWATER	GM CHANGES	DRINK WATER++L		Gh AVL		GH QLT	WAST HER		OVERALL GH	HEALTH		MISC	HAST
HELLS	SAMPLE FRED	FROM ANAL.	QUAL CHANGS++R	THERCON	RATING	COM	RATING CO	N RATING	CON	CONTAM POT	HZED	CON	10	ID NO
4	DATLY	P/O	NO **	5C A	3C	A	5 A	5	A	18	1 C	ε		1703
4	DATLY	NO	NO **	SC A	3C	A	5 A	5	A	18	10	Ç		1703
4	DATLY	NO	NO **	SC A	3 C	A	5 A	5	A	18	1 C	Ç		1703

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(GALL/DAY)

SURFACE IMPOUNDMENT ASSESSMENT (SIA) ********

LOCATION OF ASSESSMENT STATE TO NO. UTF161 LATITURE D M S LONGITUDE D M S OPERATORS OWNERS FAYE MARSHALL KEN HOLLINGSHEAD 155 EAST 100 SOUTH 397 EAST 100 SOUTH MINERSVILLE MINERSVILLE UT 84752 UT 84752

FACILITY IDENTIFICATION PLACE CATEGORY SIA SITE NO. IMPNOMETS NPPES HO. SIC CODE CNTY/CITY 24 41NERSVILLE BEAVER **OPFRATIONAL FFATURES OF IMPOUNDMENTS**

LAST YR. BURFACE APEA TOTAL SURPACE IMP. INFLOW YR.OF RECORD YHS OPEN IMP. NO. PURPOSE . AGE (ACRES) AREA (ACPES) (GALL/DAY) (YF) IN OP. 37.00 37.06 1 NST ST OR4 10 YFS LIVESTOCK LIVESTOCK LINER TYPE THICKNESS TOTAL AVE. INFLOW YEARS TOTAL AVE. EFF. IMP.FFFLUENT YF.OF NUMBER (INCHES) RECORD (GALL/DAY) RECORD (GALL/DAY) (GALL/DAY) 0 NONE **GROUNDWATER CONTAMINATION POTENTIAL ** **GROUNDWATER MONITOWING** MISC WAST CRIMINDWATER G. CHANGES DRINK WATER HALINST GH AVE GW DLT WAST HERD OVERALL GH HEALTH HELL'S SAMPLE PHEO FROM ANAL. QUAL CHANGSHARTNIGHOON RATING CON RATING CON RATING CON CONTAM POT HERD CON ID 10 NO 1703 8 UNKN ** 45 6 64 8 5 A 5 b 20 3 4

SIC CODE . 25

0

O

NUMBER

(INCHES)

a

LIVESTOCK LIVESTOCK

STC CODE

LIVESTOCK

150

NUMBER

YR.OF RECORD

LIVESTOCK

CATTLE

TYPE

ID NO 1703

************* **LOCATION OF ASSESSMENT** STATE TO NO. LATITUDE D " S LONGITUDE OWNERE OPERATOR: JIN CRAK JIM CRAW MINFRSVILLE MINFRSVILLE UT 84752 UT 84752 **FACILITY IDENTIFICATION** CATEGORY SIA SITE NO. IMPNOMNTS CNTY/CITY PLACE NPDES NO. BEAVER MINERBVILLE **DPERATIONAL FEATURES OF IMPOUNDMENTS** PUPPOSE AGF YRS OPFN LAST YR. SURFACE AREA TOTAL SUPFACE IMP. INFLOW IMP. NO. IN UBE IN OP. (ACRES) (YF) AREA (ACRES) (GALL/DAY) WST DT SPO YES 5.00 5.00 IMP.EFFLUENT YR.OF TOTAL AVE. INFLOW YR. OF TOTAL AVE. EFF. LINER TYPE THICKNESS RECORD (GALL/DAY) RECORD (GALL/DAY) (GALL/DAY) (INCHES) 1979 500 1979 NONE **GROUNDWATER MONTTORING** **GROUNDWATER CONTAMINATION POTENTIAL ** GHOUNDWATER GW CHANGES DRINK WATER ** NUNST G. AVL GH GLT HAST HZRD OVERALL GH HEALTH WELLS SAMPLE PARG FROM ANAL. QUAL CHANGS+ARTNGECON RATING CON RATING CON RATING CON CONTAM POT HIRD CON ID

O NONE UNKN ** 9A A 4C A 5 A 23 48 8

SURFACE IMPOUNDMENT ASSESSMENT (SIA)

LOCATION OF ASSESSMENT

LATITUDE 41055H40S LONGITUDE 111048H585

OPERATOR# WILLIAM HARRIS

WILLIAM HARRIS RICHHOND

STATE ID NO. UTTO12

OWNERS

RICHMOND

FACILITY IDENTIFICATION CNTY/CITY CATEGORY SIA SITE NO. IMPNDMNTS PLACE NPCES NO. SIC CODE RICHMOND CACHE ACR **OPERATIONAL FEATURES OF IMPOUNDMENTS**

IN USE YHS OPEN LAST YP. SURFACE AREA TOTAL SURFACE IMP. INFLOR YE. UF RECORD IN OP. (ACRES) AREA (ACHFS) (GALL/DAY) 1 MST DT SPO YF5 0.35 0.35 197 THP. FFFLHENT YR. OF TOTAL AVE. INFLOW YR.OF TOTAL AVE. EFF. LINER TYPE THICKNESS LIVESTOCK LIVESTOCK RECORD (GALL/DAY) RECORD (GALL/DAY) (GALL/DAY) (INCHES) NUMBER TVPF 1979 8000 197 NONE 200 **GROUNTFATER RONTTOPING** **GROUNDMATER CONTAMINATION POTENTIAL**
GWOLT WAST HZRO OVERALL GW HEALTH GROUNDWATER ON CHANGES DRINK WATERWHUNST Gn AVL WAST WELLS SAMPLE FRED FROM ANAL. QUAL CHANGS**RINGECON RATING CON RATING CON PATING CON CONTAM POT HIRD CON TO ID NO

SUPPLACE IMPOUNDMENT ASSESSMENT (STA) ***********************

STATE 10 NO. UTS162 OWNERS

UNION UIL COMPANY

##LUCATION OF ASSESSMENT##

LATITUDE & 0 8 1 W GITOPE

HEFFATTER #16 It 014*

FACILITY TOESTIFICATION CATEGORY SIA SITE WG. IMPHOMNTS NPDES NO. SIC CODE CHTY/CITY PLACE SAN JUAN 131 ** OPERATIONAL PEATURES OF IPPOUNDMENTS **

YPS OPEN LAST YM. SUPFACE AFFA TOTAL SUFFACE IMP. INFLOW YFOUR RECORD AGE AREA (ACRES) (GALL/CAY) IN OP. (ACRES) 0.00 0.06

TOTAL AVE. INFLOW YF. OF TOTAL AVE. EFF. LINER TYPE THICKNESS LIVESTOCK LIVESTOCK (GALL/DAY) RECORD (GALL/DAY) RECORD (GALL/DAY) (INCHES) NUMBER

o MONE **GROUND*ATER CONTAMINATION POTENTIAL** **GROUNDWATER MONITCHING** GROUNDWATER GW CHANGES DEINE WATER ** UNST G+ AVL ON ULT LAST HIRD DVERALL ON HEALTH MISC MAST WELLS SAMPLE FRED FROM ANAL. GUAL CHANGSAMHTINGSCON NATING CON RATING CON RATING CON CONTAM POT HIRL CON ID ID NO ** 98 B 1F 8 4 5 7 B 21 ... OD NONE

SURFACE IMPOUNDMENT ASSESSMENT (SIA)

LOCATION OF ASSESSMENT

LATITUDE D M S LONGITUDE

OPERATORE DANISH WASH

OWNERS CHASE GROSSMAN

0

STATE ID NO. UT5122

FACILITY IDENTIFICATION NPDES NO. SIC CODE CNTY/CITY PLACE CATEGORY SIA SITE NO. IMPROMNTS 131 GRAND **CPERATIONAL FEATURES OF IMPOUNDMENTS**

YRS OPEN LAST YP. SURFACE AREA TOTAL SURFACE IMP. INFLOW YEOUR RECORD AGE IMP. NO. PURPOSE IN USE AMER (ACRES) (GALL/DAY) IN OP. (ACRES) (YP) 0.00 P WST ST OFA A

LIVESTOCK LIVESTOCK TOTAL AVE. INFLOW YROUF TOTAL AVE. EFF. LINER TYPE THICKNESS IMP.FFFLUENT VA.OF (THCHES) NUMBER PECCED (GALL/UAY) (GALL/DAY) RECORD (GALL/DAY)

4) 4.411.4 **GHOUNGHATER CONTAMINATION POTENTIAL** **GROUNDWATER UDNITORING** NO. GROUNDHATER ON CHANGES LIFTING WATER RAUNST OF AVE OF WET WAST HIED GYERALL ON HEALTH MISC . #4ST HELLS SAMPLE FREQ FROM ANAL. GUAL CHANGS**RTNGROUN PATING CON PATING CON BATING CON CONTAM POT HITE CON TO TO NO 6D C ** 1F # 1E # 2 # 7 F 11

STATE ID NO. UTTITE

OWNERS ATLANTIC PICHPIFLD

LATITUDE O M S LONGITUDE

PERATORE FAST CANYON

Ð

CNTY/CITY PLACE CATEGORY SIA SITE NO. IMPROMENTS NPDES NO. SIC CODE
GRAND OAG 3 2 0 131
AOPERATIONAL FEATURES OF IMPOUNDMENTS

IMP. NO. PUPPOSE AGF IN USF YRS OPEN LAST YR. SURFACE AREA TOTAL SURFACE IMP. INFLON YR.UF RECORD

IN OP. (ACRES) AREA (ACRES) (GALL/DAY)

O WST ST DWA 0 YFS 0 0 0.00 0.00 0.00

IMP. FFFLUENT YR. OF TOTAL AVE. INFLOW YR. OF TOTAL AVE. FFF. LINER TYPE THICKNESS LIVESTOCK LIVESTOCK (GALL/OAY) RECORD (GALL/DAY) (INCHES) NUMBER TYPE

GROUNDWATER MONITORING

NO. GROUNDWATER GN CHANGES DRINK WATER**UNST GN AVL GN GLT WAST HZRD OVERALL GN HEALTH MISC WAST WELLS SAMPLE FRED FROM ANAL. GUAL CHANGE**NTNG&CGN RATING CON RATING CON CONTAM POT HZRD CCN ID 1D NO 0 NONE ** 98 5 5 6 4 6 7 8 25 0D C 2000

SURFACE IMPOUNDMENT ASSESSMENT (SIA)

LOCATION OF ASSESSMENT

STATE ID NO. UTTI11 LATITUDE D M S LUNGITUDE OWNERS

CPERATORE EAST CANYON

GETTY OIL COMPANY

##FACILITY IDENTIFICATION**

CNTY/CITY PLACE CATEGORY SIA SITE NO. IMPNOMINTS NPDES NO. SIC CODE

GRAND OAG 4 3 0 131

##OFERATIONAL FEATURES OF IMPOUNDMENTS**

THP. NO. PUPPOSE AGE IN USE YRS OPEN LAST YR. SURFACE AREA TOTAL SURFACE IMP. THEOR YH.OF RECORD

(YR)

O MST ST OP4 O YFS O 0 0.00 0.00 0.00 0.00

IMP_EFFLUENT YP_OF TOTAL AVE, IMPLOW YP_OF TOTAL AVE, EFF. LINED TYPE THICKNESS LIVESTOCK (IVESTOCK (GALL/DAY) PECOPO (GALL/DAY) (INCHES) NUMBER TYPE

GROUNDWATER MONITORING

**GROUNDWATER GROWNDWATER HIS WASTAND GROWNDWATER GROWNDWATER GROWNDWATER HIS WASTAND GROWNDWATER HIS CHARLES GROWNDWATER GROWNDWATER

SUFFACE IMPOUNDMENT ASSESSMENT (SIA) **********

STATE 10 NO. UTFINE OWNERS

RESERVE OIL AND GAS

LATITODE of M & LIMIGITUDE

OPPHATORS PETERS POINT

O

FACILITY IDENTIFICATION CNTY/CITY PLACE CATEGORY STA SITE NO. IMPROHMTS NPOES NO. SIC CODE CARBON 131 **OPERATIONAL FEATURES OF IMPOUNDMENTS**

AGE THE OPEN LAST TR. SURFACE AREA TOTAL SUFFACE IMP. INFLOW TH.OF RECORD IN USE (YP) IN OP. (ACRES) AREA (ACRES) (GALL/DAY) ST OPA YES 0.00 9,00

IMP.EFFLUENT YR.OF TOTAL AVE. INFLOW VR.OF TOTAL AVE. EFF. LINER TYPE THICKNESS LIVESTOCK LIVESTOCK (GALL/DAY) RECORD RECORD (GALL/DAY) (GALL/OAY) (INCHES) NUMBER

GROUNDWATER MONITORING ** GROUNDWATER CONTAMINATION POTENTIAL ** NO. GROUNDWATER GH CHANGES DRINK WATERSHINST GH AVL GH GLT WAST MEAD LIVERALL ON HEALTH FISC WAST WELLS BAMPLE FRED FROM ANAL. QUAL CHANGS+ARTNG&CON RATING CON PATING CON RATING CON CONTAM POT HERD CON ID ID NO NONE ** 5C # 3C 6 4 7 8 19 0.0 2000

> SURFACE IMPOUNDMENT ASSESSMENT (SIA) **********

LOCATION OF ASSESSMENT

LOCATION OF ASSESSMENT

STATE ID NO. UTL104 LATITUDE D H & LONGITUDE OWNERS

OPERATORE

CORDILLERA CORPOPATION

CLEAR CREEK

0

FACILITY IDENTIFICATION CNTY/CITY CATEGORY SIA SITE NO. IMPNOMETS PLACE NPEFS NO. SIC CODE CAPBON 131 **OPERATIONAL FEATURES OF IMPOUNDMENTS**

IMP. NO. PURPOSE LAST YR. SURFACE APEA TOTAL SURFACE IMP. INFLOW YN.OF RECORD - AGF (YF) IN OP. (ACRES) AREA LACKES) (GALL/DAY) O WST STOPA O YFS 0.00 9.00

IMP.FFFLUENT WM.OF TOTAL AVE. INFLOW YM.OF TOTAL AVE. EFF. LIMER TYPE THICKNESS LIVESTOCK LIVESTOCK (GALL/DAY) PECONO RECORD (GALL/DAY) (GALL/GAY) (INCHES) NUMBER 13 FORE

GROUNDWATER MONITORING **GHIS-MONATER CONTAMINATION POTENTIAL ** GROUNDHATER ON CHANGES DININK WATER CHINST OF AVE GR GLT WAST HZED OVERALL ON HEALTH HELLS SAMPLE PAPO FROM ANAL. WHAL CHANGS .. ATTNGKCEN RATING CON HATTNG CON RATING CON CONTAN POT HIND CON TO 10 NO NONE ** 30 P 3C F a F 7 F 17

**LOCATION OF ASSESSMENTS STATE ID NO. UTHIS

LATITUDE D D & LONGITUDE OwnEF#

PLACE

CNTY/CTTY

FMERY

GRASSY THAILS

VEHN BOLINDES

0

FACILITY TOENTIFICATION

CATEGORY SIA SITE NO. IMPRIDANTS NPDFS NO. SIC CODE DAG 131

OPERATIONAL FEATURES OF IMPOUNDMENTS

YRS OPEN LAST YM. SURFACE AREA TOTAL SURFACE IMP. INFLOW YR.OF RECORD IN OP. (ACPES) AREA (ACRES) (GALL/DAY) 0.00 O MST ST ORA YES 0,00

IMP. EFFLUENT YR. OF TOTAL AVE. INFLOW YR.OF TOTAL AVE. FFF. LIMER TYPE THICKNESS LIVESTOCK LIVESTOCK RECORD (GALL/DAY) RECORD (GALL/DAY) (INCHES) NUMBER TYPE (GALL/DAY)

O NONE **GROUNDWATER CONTAMINATION POTENTIAL ** **GROUNDWATER MONITORING** GROUNDWATER GH CHANGES OFFINE MATER ** LINST G. AVL GR GLT WAST HEAD OVERALL GH HEALTH WELLS SAMPLE FRED FROM ANAL. GUAL CHANGSASTINGSCON RATING CON RATING CON RATING CON CONTAM POT HZRU CON ID ID NO 0 None 49 98 E 58 8 4 H 7 8 25 OD C 2000

SURFACE IMPOUNDMENT ASSESSMENT (SIA)

LOCATION OF ASSESSMENT

STATE ID NO. UTL014 LATITUDE D M S LONGITUDE OWNER#

DPEPATORS MOGBACK PIDGE

AMERICAN QUASAR PETROLEUM

FACILITY IDENTIFICATION CATEGORY SIA SITE NO. IMPNDHATS NPDES NO. SIC CODE CNTY/CITY PLACE RICH 131

OPERATIONAL FEATURES OF IMPOUNDMENTS

PURPOSE AGE YRS OPEN LAST YR. SUPFACE AREA TOTAL SURFACE IMP. INFLOR YR.UF RECORD IN HSE IN OP. (ACRES) AREA (ACRES) (GALL/DAY) 0.00 0.00

TOTAL AVE. INFLOW YH.OF TOTAL AVE. FFF. LINER TYPE THICKNESS IMP.FFFLUENT YR.OF LIVESTOCK (GALL/DAY) RECUPD (GALL/DAY) PECORD (GALL/DAY) (INCHES)

o **GROUNDWATER MONITORING** **GROUNDWATER CONTAMINATION POTENTIAL** NO. GROUNDWATER GW CHANGES DRINK WATERWAUNST GW AVL GR OLT WAST HEAD OVERALL ON HEALTH WELLS SAMPLE FRED FFOH ANAL. QUAL CHANGS+#FINGECON HATING CON HATING CON RATING CON CONTAN POT MEND CON 10 10 NO NONE ** 25 H 1F 6 5 H 7 H 15 0 D

LOCATION OF ASSESSMENT STATE ID 40.

OWNERS

LATITUDE D M S LONGTTUDE

OPERATORE

HLSMY DIL COMPANY GREATER ALTAHONT TOS HOW UINTAH BASIN

FACILITY IDENTIFICATION

CATEGORY SIA SITE NO. IMPNOHNTS NEDES NO. CNTY/CITY PLACE SIC CODE DUCHESNE CAG 65 13 131

OPERATIONAL FEATURES OF IMPOUNDMENTS

IHP. NO. PURPOSE AGE YRS OPEN LAST YR. SURFACE AREA TOTAL SURFACE IMP. INFLOW YR.OF HECORD AREA (ACRES) (GALL/DAY) IN OP. (ACRES) U HST ST ORA O YFS 0.00 0.0

IMP.FFFLUENT YR.OF TOTAL AVE. INFLOW YR.OF TOTAL AVE. EFF. LINER TYPE THICKNESS

(GALL/DAY) RECORD (GALL/DAY) RECORD (GALL/DAY) (INCHES) NUMBER 0

GROUNDWATER MONITORING **GROUNDWATER CONTAMINATION POTENTIAL**

NO. GPOINDMATER GW CHANGES DRINK MATER**UNST GW AVL GW ULT MAST MET DVFFALL GW MEALTH MISC WAST
WELLS SAMPLE FROM ANAL. GUAL CHANGS***RING**CON RATING CON RATING CON RATING CON CONTAM POT HZRO CON 1D ID NO

NONF ** 30 A 1C B 5 A 7 8 16 OD C 2000 ID NO 2000

SUPPACE IMPHUNDMENT ASSESSMENT (514)

STATE TO NO. 7010052

PHILLIPS PETROLEUM

LATITHOF D M S LONGITUDE

OPERATIONS BRIGGER (ARE

0

FACILITY IDENTIFICATION

CNTY/CITY PLACE CATEGORY SIA SITE NO. IMPHONNES NPDFS NO. SIC CODE

SUMMIT OAG 11 0 0 131

OPERATIONAL FEATURES OF IMPOINDMENTS

IMP. NO. PURPOSE AGE IN USE YRS OPEN LAST YR. SURFACE AMEA TOTAL SURFALE IMP. INFLOW YR.OF RECORD

(YH) IN UP. (ACRES) AMEA (ACRES) (GALL/DAY)

O WST ST ORA O YES O O O.OU W.OO O

IMP_EFFLHENT YR.OF TOTAL AVE. INFLOW YR.OF TOTAL AVE. EFF. LINER TYPE THICKNESS LIVESTOCK LIVESTOCK (GALL/DAY) RECORD (GALL/DAY) RECORD (GALL/DAY) (INCHES) NUMBER TYPE

SURFACE IMPOUNDMENT ASSESSMENT (SIA)

LOCATION OF ASSESSMENT

**LOCATION OF ASSESSMENTER

LATITUDE D M S LONGITUDE

OPERATORE

CHEVRON CHEVENDE BEND

0

STATE ID NO. UTRO73

OWNERS

FACILITY IDENTIFICATION

CATEGORY SIA SITE NO. IMPNOMENTS UPDES NO. SIC CODE

UINTAM OAG 12 0 131

OPERATIONAL FEATURES OF IMPOUNDMENTS

TMP. NO. PHRPOSE AGE IN USF YRS OPEN LAST YR. SURFACE AREA TOTAL SURFACE TMP. TMFLOW YR.OF RECORD

(YR) IN OP. (ACRES) AMER (ACRES) (GALL/DAY)

O MST ST OFFA D YES D O O.OO 0.00 0.00

IMP.FFFLUENT YR.OF TOTAL AVF. (NFLOW YR.OF TOTAL AVE. FFF. LINER TYPE THICKNESS LIVESTOCK LIVESTOCK (GALL/DAY) FECOPD (GALL/DAY) (INCHES) NUMBER TYPE

GROUNDKATER MONITORING

NO. GROUNDHATER GH CHANGES DRINK HATER**URST GH AVL GN GLT HAST HZRD DVERALL GH HEALTH MISC HAST HZLL SAMPLE FREG FROM ANAL. GUAL CHANGS**RINGECCH RATING CON HATING CON RATING CON CONTAN FOT HZPD CON ID ID NO. 0 NOME

** 30 + 10 + 5 + 7 + 16 + 00 + 2000

و الفرائد في الفرائد و الفرائد في الفرائد و الفرائد في ا

LOCATTON OF ASSESSMENT STATE TO NO. UTLB41 DWNERS

LATITUDE D H S LONGITUDE

HPEHATOUR PINFVIFE

AMERICAN QUASAR PETROLEUM

FACILITY IDENTIFICATION CHTY/CITY CATEGORY SIA SITE NO. IMPHEMNTS PLACE NPDES NO. SIC CODE SUMMIT 131

OPERATIONAL FEATURES OF IMPOUNDMENTS

IN USE YES OPEN LAST YM. SURFACE AREA TOTAL SURFACE IMP. INFLOW YR.OF RECORD IN GP. LACREST AREA LACRES) (GALL/DAY) 0 WST ST OP4 0 0.00 0.00

IMP, EFFLUENT YP. OF TOTAL AVE. INFLOW YR.OF TOTAL AVE. EFF. LINER TYPE THICKNESS LIVESTOCK LIVESTOCK (GALL/DAY) RECORD (GALL/DAY) RECORD (GALL/DAY) (INCHES)

0 NOAF **GROUNDWATER HONITORING** **GROUNDHATER CONTAMINATION POTENTIAL**

GROUNDWATER GH CHANGES DRINK WATER**UNST GK AVL GROLT HAST HIRD OVERALL ON HEALTH MISC HAST WELLS BAMPLE FRED FROM ANAL. GUAL CHANGS**RTNG&CCN RATING CON RATING CON RATING CON CONTAM POT HIRD CON 10 10 NO NONE ** 5C B 3C B 5 B 7 B 20 CD C 2000

SURFACE IMPOUNDMENT ASSESSMENT (SIA)

LOCATION OF ASSESSMENT

LATITUDE D H S LONGITUDE.

CPERATORE PINEVIEW

STATE ID NO. UTLANT OWNER CHAMPLIN PETROLEUM

FACILITY IDEATIFICATION

CHTY/CITY PLACE CATEGORY SIA SITE NO. IMPROMNTS APOFS NO. SIC CODE DAG 10 SUMMIT 131 **OFERATIONAL FLATURES OF IMPOUNDMENTS**

IMP. NO. PUPPOSE AGE IN USE YPS OPEN LAST YR. SURFACE ARFA TOTAL SURFACE IMF. INFLOW YP.OF RECOND (ACRES) AREA (ACRES) (GALL/DAY) IN OP. 0.00 4.06

IMP. FFFLUENT YP. UF TOTAL AVE. INFLOW YR.CF TOTAL AVE. EFF. LINER TYPE THICKNESS LIVESTOCK LIVESTOCK RECORD RECORD (GALL/DAY) (INCHES) (GALL/DAY) (GALL/DAY) 0 6 n

GROUNDWATER MONITORING **GROUNDWATER CONTAMINATION POTENTIAL** GROUNDWATER GA CHANGES DRINK WATER ** OUNST GA AVL GA GLT WAST HZRD UVERALL GA HEALTH WELLS SAMPLE PRED FROM ANAL, WUAL CHANGS+#RTNG&CON NATING CON RATING CON RATING CONTONTAM POT HERD LGN ID ID NO ** 50 E 30 B 5 F 7 8 20 OC D 2000

STATE ID NO. UTRO73 CHNF & #

LOCATION OF ASSESSMENT LATITUDE D P S LONGITUDE

*ADPERATIONAL FEATURES OF IMPOUNDMENTSAN

OPFFATOR= FLYING DIAMOND

HORSHUE HEND

0

FACILITY IDENTIFICATION CNTY/CITY PLACE CATEGORY SIA SITE NO. INPUBHATS MINTAN 15

MPDES NO. SIC CODE 131

YRS OPEN LAST YR. SUFFACE AFFA TOTAL SUFFACE IMP. INFLOW YROUS RECORD (YP) (ACHES) AHEA (ACRES) (GALL/DAY) IN OP. WST ST ORA 0 0.00 0.00

IMP.EFFLUENT YR.OF TOTAL AVE. INFLOW YROOF TOTAL AVE. EFF. LINER TYPE THICKNESS LIVESTOCK LIVESTOCK (GALL/DAY) RECORD (GALL/DAY) PECORD (GALL/DAY) (INCHES)

NONE **GROUNDWATER MONITORING** **GPOUNDWATER CONTAMINATION POTENTIAL** GROUNDWATER ON CHANGES DRINK MATER*AUNST GH AVE GH GLT HAST HIRD OVERALL GH HEALTH HISC WAST WELLS SAMPLE FRED FROM ANAL. QUAL CHANGS + RTINGECON RATING CON RATING CON RATING CON CONTAM POT HIRO CON ID ID NO NONE ** 30 & 10 8 5 8 7 8 16 ÖD 2000

> SURFACE IMPOUNDMENT ASSESSMENT (ETA) ********

LOCATION OF ASSESSMENT

LATITUDE D H S LONGITUDE

OPEPATOR#

OWNERS GULF OIL CORPORATION

HOPSHOE BEND

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STATE ID NO. UTPO73

FACILITY IDENTIFICATION CATEGURY STA SITE UD. IMPHONATS

CHTY/CITY NPDES NO. SIC CODE DINTAH 16 131

** OPERATIONAL FEATURES OF IMPOUNDMENTS**

AGF YRS OPEN LAST YP. SURFACE AREA TOTAL SURFACE IMP. INFLOW (YR) (ACRES) IN UP. AREA (ACHES) (GALL/DAY) WST ST URA 8.00 0.80

IMP.EFFLHENT VP.OF TOTAL AVE. INFLOW YEACH TOTAL AVE. EFF. LINER TYPE THICKNESS LIVESTOCK LIVESTOCK (GALL/DAY) PECORD (GALL/NAY) RECOFF (GALL/DAY) (INCHES) NUMBER

0 NOVE **GPOUNDWATER MONITURING** **GPOUNDWATER CONTAMINATION POTENTIAL** GROUNDWATER GW CHANGES DETNE WATERWAUNST GR AVE GH GLT HAST HZFR OVERALL GH HEALTH MFLLS SAMPLE FRED FROM ANAL, GUAL CHANGS MARTHGROUP FATING CON FATING CON PATING CON CONTAM BOT HIRD CON HOME 7 5 16 7 5 16 00 C 10 NO 2000

SUPPORE IMPOUNDMENT ASSESSMENT (STA) ******

**LOCATION OF ASSESSMENTER STATE ID NO. UTP073

LATITUDE P N S LONGITUDE

OPERATURE HORSHUF BEND

COMMANCHE OIL

OHNERS

FACILITY IDENTIFICATION CATEGORY SIA SITE NO. IMPLOMNTS CHTY/CITY PLACE UINTAH DAG

13 **OPERATIONAL FEATURES OF IMPOUNDMENTS**

131

SIC CODE

NPDES NO.

IMP. NO. PUPPOSE AGF YRS OPEN LAST YR. SUFFACE AREA TOTAL SURFACE IMP. INFLOW YR.OF RECORD IN USE (ACRES) AREA (ACHES) (GALL/DAY) IN OP. WST ST DRA 0 YFS 0.00 0.00

IMP.EFFLUENT YP.OF TOTAL AVE. INFLOW YR.OF TOTAL AVE. EFF. LINER TYPE THICKNESS LIVESTOCK LIVESTOCK RECORD (GALL/DAY) (GALL/DAY) RECORD (GALL/DAY) (INCHES) NUMBER 0

GROUNDWATER MONITORING

NO. GROUNDWATER GW CHANGES DRINK WATER**LINST GW AVL GK QLT MAST MERG DVERALL GW MEALTH MISC WAST HELLS SAMPLE FREE FROM ANAL. QUAL CHANGS ** FINGECCH PATING CON RATING CON FATING CON CONTAM POT HERO CON ID ** 30 8 1C 5 5 8 7 8 16 00 . C 2000

SURFACE IMPOUNDMENT ASSESSMENT (SIA)

BALOCATION OF ASSESSMENTAR

LATITUDE D M & LONGITUDE

OPERATORS

OWNERS DIAMOND SHAMROCK

HORSHDE BEND

FACILITY IDENTIFICATION SIC CODE NEDES NO. CHTY/CITY PLACE CATEGORY SIA SITE NO. IMPERHETS 131 14 HATHIU **OPERATIONAL FEATURES OF IMPOUNDMENTS**

LAST YR. SURFACE AREA TOTAL SURFACE IMP. INFLOW YR.OF RECORD AGE IN USE IMP. NO. (ACRES) AREA (ACHES) (GALL/DAY) IN OP. 0.00 O WST ST ORA YFS

LIVESTOCK LIVESTOCK TOTAL AVE. INFLOW YPOUF TOTAL AVE. FFF. LINEP TYPE THICKMESS IMP.FFFLUENT YP.OF NUMBER (INCHES) (GALL/DAY) RECORD (GALL/DAY) (GALL /DAY') RECOPO

NONE **GROUNDATER CONTAMINATION POTENTIAL ** **GROUNDWATER MONITORING** GROUNDWATER GH CHANGES DRINK HATERARUNST GH AVL GH GLT MAST HZRU DYFRALL GN HEALTH WELLS SAMPLE FREG FROM ANAL. QUAL CHANGS .. ATTING CON RATING CON RATING CON CONTAN POT HERD CON TO TO NO 4 3 3 H 10 H 5 C 7 B 16 2000 0 O

STATE ID NO. UTRO73

0.00

STATE IS NO.

LATITUDE U M S EUNGITUDE

I-PE - ATORE

OWNER . GULF OIL CORPORATION

0

DISCHESNE THE RAN

FACILITY IDENTIFICATION

CATEGORY SIA SITE NO. IMPROMNTS CNTY/CITY PLACE DUCHESNE

SIC CODE NPDFS NO. DAG 19 1 **DREGATIONAL FEATURES OF IMPOUNDMENTS**

YRS OPEN LAST YP. SURFACE APPA TOTAL SURFACE IMP. INFLOW YE.OF RECORD PURPOSE AGE IN PRE (ACRES) APEA (ACRES) (GALL/DAY) (YR) 15 OP. 0.00 0.00

IMP.EFFLUENT YR.OF TOTAL AVE. INFLOW VR.OF TOTAL AVF. EFF. LINER TYPE THICKNESS LIVESTOCK LIVESTOCK (GALL/DAY) RECORD (GALL/DAY) RECORD (GALL/DAY) (INCHES) NUMBER TYPE

U 0 **GROUNDWATER MONITORING**

GROUNDWATER GW CHANGES DRINK WATERUNST GW AVL GW GLT WAST HZRD CVFWALL GW HEALTH MISC WAST WELLS SAMPLE FREQ FROM ANAL. QUAL CHANGE**RETUGECON PATING CON RATING CON RATING CON CONTAM POT MERD CUN ID ID NO n ** 9E 4 SA 8 5 A 7 P 26

SUPFACE IMPOUNDMENT ASSESSMENT (SIA)

LOCATION OF ASSESSMENT

LATITUDE D M S LONGITUGE

OPERATORS

OIL DEVELOPERS OF UTAH

STATE ID NO.

INDIAN PIDGE THE HEM

FACILITY IDENTIFICATION

CATEGORY SIA SITE NO. IMPRODUITS SIC CODE NPDES DO. CHTY/CITY FLACE 24 131 DUCHESHE **OPERATIONAL FEATURES OF IMPOUNDMENTS**

YRS OPEN LAST YP. SURFACE AREA TOTAL SURFACE IMP. INFLOR YR. CF RECORD IMP, NO. PURPOSE AGE TH USE AHEA (ACRES) (GALL/PAY) IN OP. (ACRES) 0.00 WST ST DRA O 0.00

IMP. FFFLUENT YR.OF TOTAL AVE. INFLOW YR.OF TOTAL AVE. FFF. LIMET TYPE THICKNESS LIVESTOCK LIVESTOCK (INCHES) PELDHE (GALL/DAY) RECORD (GALL/DAY)

Ω NO FIF **GROUNDWATER MONITORING**

NO. GROUNDWATER GW CHANGES DRINK KATER**UNST GW AVL GW DIT WAST WRD OVERALL GW HEALTH MISC WAST WELLS SAMPLE FRED FROM ANAL. GHAL CHANGS***** GW AVL GW RATING CON PATING CON CONTAM POT MIRO CON 10 10 NO 0 NOWF *** 94 4 34 5 4 7 % 24 54 5 2000

recommendation of the second

STATE ID NO.

**LUCATION OF ASSESSMENTA*
LATITUDE D O S LONGITUDE

DEFRATORS

SEAT SENT STUG VARIABLE

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ATLATIC RICHFIFLD

CHTY/CITY PLACE CATEGORY SIA SIIF NO. IMPNOMMIS NPDFS NO. SIC CODE
BAN JUAN GAG 17 30 0 0
addreitional features of impoundments.a

TMP. NO. PUPPOSE AGE IN USE YMS OPEN LAST YR. SUPFACE AREA TOTAL SURFACE IMP. INFLOW YR.OF RECORD

(YR)

O MST ST ORA O YES O O O.OO U.OO 0

IMP_EFFLUENT YR_OF TOTAL AVE. INFLOW YR_OF TOTAL AVE. EFF. LINER TYPE THICKNESS LIVESTOCK LIVESTOCK (GALL/DAY) RECORD (GALL/DAY) (GALL/DAY) (INCHES) NUMBER TYPE OF THE PROPERTY OF THE PROPER

SURFACE IMPOUNDMENT ASSESSMENT (SIA)

STATE ID NO. OWNERS FRIAR OIL **LOCATION OF ASSESSMENT**
LATITUDE D M S LONGITUDE

D M S
OPERATOR#
DUCHESME TASRAM

0

CNTY/CITY PLACE CATEGORY SIA SITE NG. IMPNOMINTS NPDES NO. SIC CODE DUCHESNE DAG 18 0 131

**PACILITY IDENTIFICATIONS*

CATEGORY SIA SITE NG. IMPNOMINTS NPDES NO. SIC CODE 18 0 131

APPRATIONAL FEATURES OF IMPOUNDMENTS

IMP. NO. PURPOSE AGE IN USE YMS OPEN LAST YR. SURFACE AREA TOTAL SURFACE IMP. INFLOK YH.OF RECORD

(YR)

NO. PURPOSE AGE IN USE YMS OPEN LAST YR. SURFACE AREA TOTAL SURFACE IMP. INFLOK YH.OF RECORD

(YR)

NO. PURPOSE AGE IN USE YMS OPEN LAST YR. SURFACE AREA TOTAL SURFACE IMP. INFLOK YH.OF RECORD

(YR)

NO. PURPOSE AGE IN USE YMS OPEN LAST YR. SURFACE AREA TOTAL SURFACE IMP. INFLOK YH.OF RECORD

(YR)

NO. PURPOSE AGE IN USE YMS OPEN LAST YR. SURFACE AREA TOTAL SURFACE IMP. INFLOK YH.OF RECORD

(YR)

NO. WST ST ORA 0 YES 0 OF 10 OPEN LAST YR. SURFACE AREA TOTAL SURFACE IMP. INFLOK YH.OF RECORD

O WST ST ORA 0 YES 0 OF 10 OPEN LAST YR. SURFACE AREA TOTAL SURFACE IMP. INFLOK YH.OF RECORD

O WST ST ORA 0 YES 0 OPEN LAST YR. SURFACE AREA TOTAL SURFACE IMP. INFLOK YH.OF RECORD

O WST ST ORA 0 YES 0 OPEN LAST YR. SURFACE AREA TOTAL SURFACE IMP. INFLOK YH.OF RECORD

O WST ST ORA 0 YES 0 OPEN LAST YR. SURFACE AREA TOTAL SURFACE IMP. INFLOK YH.OF RECORD

IMP-EFFLUENT YR-OF TOTAL AVE. INFLOW YR-OF TOTAL AVE. EFF. LINEN TYPE THICKNESS LIVESTOCK LIVESTOCK (GALL/DAY) PECOPD (GALL/DAY) PECOPD (GALL/DAY) (INCHES) NUMBER TYPE

O O O DONE OF THE PROPERTY OF

STREACE TAROUNCHERT ASSESSMENT (STA)

STATE ID NO.

HNEMS

++LOCATION OF ASSESSMENT++
LATITUDE 0 + 5 LONGITULE

OPERATORE

MAPCO INCORPORATED

0

GREATER ALTAMONT TES HER DINTAR BASIN

FACILITY IDENTIFICATION

CNTY/CITY PLACE CATEGORY \$1A SITE NO. IMPH-DMNTS NPDES NO. SIC CODE

DUCHESNE CAG 45 21 0 131

OPERATIONAL FEATURES OF IMPOUNDMENTS

IMP. NO. PURPOSE AGE IN USE YHS OPEN LAST YR. SUFFACE AREA TOTAL SUFFACE IMP. INFLOM YH.OF RECORD

(YR) IN OP. (ACHES) AREA (ACRES) (GALL/DAY)

0 NST ST ORA 0 YES 0 0 0.00 0.00 0.00 0.00

IMP. EFFLUENT YM.OF TOTAL AVE. INFLOW YM.OF TOTAL AVE. EFF. LINEW TYPE THICKNESS LIVESTOCK LIVESTOCK (GALL/DAY) RECOPD (GALL/DAY) (INCHES) NUMBER TYPE O O NOME O

GROUNDWATER MONITOHING

NO. GROUNDWATER GW CHANGES DRINK WATEH**UNST GW AVL GW GLT FAST HZPD UVEHALL GW MEALTH MISC WAST
MELLS SAMPLE FREG FROM ANAL, QUAL CHANGS**ARTNGSCON RATING CON RATING CON CONTAM POT HZRD CON ID ID NO

NONE

** 2D A 3C 6 5 4 7 H 17 OD C 2000

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SUFFACE IMPROMEMENT ASSESSMENT (STAT)

STATE ID HO.

LITEX OIL COMPANY

LOCATION OF ASSESSMENT
LATITUDE O N S LUMBITUDE

CPEPATORE

GREATER ALTAMONT TAS ASK DINTAR MASIN

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CNTY/CITY PLACE CATEGORY SIA SITE NO. IMPRODUITS NPDFS NO. 8IC CODE UAG 29 9 0 131

IMP, NO. PHRPORF AGE IN USE YES OPEN LAST YH. SURFACE APEA TOTAL SHEFACE IMP. INFLOW YE.OF RECORD

(YR) IN CP. (ACPPS) AREA (ACRES) (GALL/DAY)

O MST ST ORA 0 YES O O O O.000 0.900 0.900

IMP. EFFLUENT YR. OF TOTAL AVE. IMPLOW YR. OF TOTAL AVE. FFF. LINER TYPE THICKNESS LIVESTOCK LIVESTOCK (GALL/DAY) FECURD (GALL/DAY) (INCHES) NUMBER TYPE

GROUNDHATER MONITORING

GROUNDHATER MONITORING

GROUNDHATER GW CHANGES DRINK HATERUNST G* AVL G* GLT WAST MYRE COVERALL GW HFALTH **ISC WAST

WELLS SAMPLE FRED FROM ANAL. GUAL CHANGS***HINGECUN RATING CON HATING CON RATING CON CONTAM POT MYRD CON ID IO NO

** 6C A 1C B 5 A 7 P 19 OD C 2000

SURFACE IMPOUNDMENT ASSESSMENT (SIA)

STATE ID NO. OKNERM

ABAMERA OIL COMPANY

LATITUDE D M S LONGITUDE

D M S OPERATORS

GPEATER ALTAMONT TAS ROW UINTAM HASIN

0

FACILITY IDENTIFICATION

CNTY/CITY PLACE CATEGORY SIA SITE NO. IMPLOMNTS MPDES NO. SIC CODE

DUCHESNE CATEGORY SIA SITE NO. IMPLOMNTS MPDES NO. SIC CODE

131
OPERATIONAL FEATURES OF IMPOUNDMENTS

IMP. NO. PURPOSE AGE IN USE YRS OPEN LAST YR. SURFACE AREA TOTAL SURFACE IMP. INFLOW YR.OF RECORD

(YR)

(WST ST ORA 0 YES 0 0 0 0.00 0.00 0.00 0.00

TMP. FFFLHENT YR. OF TOTAL AVE. INFLOW YR. OF TOTAL AVE. EFF. LINES TYPE THICKNESS LIVESTOCK LIVESTOCK (GALL/DAY) RECORD (GALL/DAY) RECORD (GALL/DAY) (INCHES) NUMBER TYPE

O O O HOLE DESCRIPTION POTENTIAL**

GPOUNDWATER HUNITORING

NO. GROUNDWATER GW CHANGES DRINK WATER**UNST GW AVL GW WIT WAST HZRD OVERALL GW HEALTH HISC WAST WELLS SAMPLE FRED FROM ANAL, GUAL CHANGS**FINGWCCH PATING CUW HATING COW RATING COW CENTAM POT HZRD COW TD 1D NO NOUNF

**20 A 10 B 7 A 7 B 15 OU C 2000

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STATE ID NO. OWNERS DIAMOND SHAMPOCK

STATE ID NO.

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LOCATION OF ASSESSMENT
LATITORS OF C S LONGITUDE

7 % % F

GREATER ALTANOUT TES RAW UINTAH BASIN

FACILITY IDENTIFICATION

CNTY/CITY PLACE CATEGORY SIA SITE NO. THROUGHOUTS NPDES NO. SIC CODE DUCHESHE OAG 51 5 0 131 **OPERATIONAL FEATURES OF IMPOUNDMENTS**

IMP. NO. PURPOSE AGE IN USE YES OPEN LAST YES SURFACE AREA TOTAL SURFACE IMP. TRELOW YES. UP. OP. (ACRES) AREA (ACRES) (GALL/DAY)

O WST ST ORA O YES. U.O. U.OU. U.OU. O.O.

IMP_EFFLUENT YR_OF TOTAL AVE. INFLUE YR_OF TOTAL AVE. EFF. LINER TYPE THICKNESS LIVESTOCK LIVESTOCK (GALL/DAY) RECORD (GALL/DAY) RECORD (GALL/DAY) (IMCHES) NUMBER TYPE

O O O O O NONE U

GROUNDWATER MONITORING

GROUNDWATER MONITORING

GROUNDWATER CDMIAMINATION POTENTIAL

GROUNDWATER CDMIAMINATION POTENTIAL

GROUNDWATER GW. CHANGES DRINK WATERUNST GW AVL GW OLT WAST HZFU OVERALL GW HEALTH MISC WAST

HELLS SAMPLE FREG FROM ANAL. QUAL CHANGS*FINGSCON PATING CON RATING CON CONTAM POT HZRD CON 1D 10 NO

*** NONE

*** 30 A 10 B 5 A 7 H 16 OD C 2000

SURFACE IMPOUNDMENT ASSESSMENT (SIA)

LOCATION OF ASSESSMENT

LATITUDE D M S LONGITUDE

C M S

OWNERS OPERATORS GREATER ALTAMONI T2S HAW DINTAM BASIN

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FACILITY INENTIFICATION

CNTY/CITY PLACE CATEGORY SIA SITE NO. IMPROMENTS NUMBES NO. SIC CODE

DUCHESNE OAG 52 23 0 131

CPERATIONAL FEATURES OF IMPOUNDMENTS

IMP. NO. PURPOSE AGE IN USE YES OPEN LAST YES SURFACE AFFA TOTAL SUBFACE IMP. INFLEM YESUF RECORD

(YR)

O MST ST UPA 0 YES 0 0 0 0.00 0.00 0.00 0.00

IMPREFFLUENT VRONG TOTAL AVE. INFLOW YPOUR TOTAL AVE. FFF. LIMPT TYPE IMPLEMENTS LIVESTOCK LIVESTOCK (GALL/DAY) RECORD (GALL/DAY) (INCHES) NUMBER TYPE

##GROUNDWATEH HONITORING##

HO. GROUNDWATER GA CHANGES ORIUK *ATER##UNSI GA AVL GA GIT AASI HZFO OVERALL GA HEALTH MISC *AST
HELLS SAMPLE FRFU FPUM ANAL. QUAL CHANGS**FTMGACCK MATING CUN KATING CON MATING CUN COLUAM PUT HZRO CON ID ID NO

O HONE

** 30 A 10 9 5 7 7 16 00 C 2000

SUMFACE IMPRODUCTION ASSESSMENT (SIA)

STATE ID NO. OWNERS

LOCATION OF ASSESSMENT
LATITUDE & M. S. LONGITUDE

0 PF # 4 1 / 4 #

BON VALLEY EXPLIFATIONS

GEFATER ALTAPUNT TOS FAN UINTAM BASIN

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FACILITY ICENTIFICATION

CONTY/CITY PLACE CATEGORY SIA SITE NG. IMPROMETS NPDES NG. SIC CODE DUCHESNE DAG 49 7 0 131

IMP. NO. PURPOSE AGE IN USE YES OPEN LAST YP. SUMFACE AREA TOTAL SURFACE IMP. INFLOR YP.OF HELOHD

(YR)

O MST ST DRA 0 YES 0 0 0.000 2.00 0 0

IMP_EFFLUENT YR_OF TOTAL AVE. INFLUM YR_OF TOTAL AVE. EFF. LIMER TYPE THICKNESS LIVESTOCK LLVESTOCK (GALL/DAY) RECORD (GALL/DAY) (IMCHES) NUMBER TYPE

O O O O O O O O NONE O NONE O NONE O **GROUNDWATER MINITORING**

NO. GROUNDWATER MINITORING**

NO. GROUNDWATER GO CHANGES DPINK WATER**UNST GO AVE GO GET WAST HZRD OVERALE GO HEALTH MISC WAST WELLS SAMPLE FREG FROM ANAL. GUAL CHANGS***FINGSCCN RATING CON PATING CON CONTAM POT HZRD CON ID ID NO O NONE ** 30 A 10 B 5 A 7 P 16 GD C 2000

SURFACE IMPOUNDMENT ASSESSMENT (SIA)

LOCATION OF ASSESSMENT

LATITUDE D M S LONGITUDE

netay constitute of an

CHEVRON OIL CORPORATION

GREATER ALTAPONT TES RAN UINTAM BASIN

0

STATE ID NO.

FACILITY INFOITIFICATION

CNTY/CITY PLACE CATEGORY SIA SITE NO. IMPRODUNTS NPDFS NO. SIC CODE

DUCHEBNE GAG 50 8: 0 131

OPERATIONAL FEATURES OF IMPOUNDMENTS

THP. NO. PURPOSE AGE IN USE YES OPEN LAST YP. SURFACE AREA TOTAL SURFACE IMP. TNFLOR YES OF RECORD

(YE)

O NST ST DRA O YES O O 0.00 0.00 0.00 0

IMP-FFFLUENT YR-OF TOTAL AVE. INFLOW YR-OF TOTAL AVE. FFF. LINER TYPE THICKNESS LIVESTOCK LIVESTOCK (GALL/DAY) PECOND (GALL/DAY) (GALL/DAY) (IMCHES) NUMBER TYPE

**GROUNDWATER UNITED BY AND TO BE AN

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SURFACE IMPOUNDMENT ASSESSMENT (SIA) -************

LOCATION OF ASSESSMENT STATE ID NO.

CNTY/CITY

DUCHESNE

LATITUDE D M S LONGITUDE

OWNERD SHELL DIE CORPORATION OPERATORS GREATER ALTAMONT TIS RIK WINTAM BASIN

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FACILITY IDENTIFICATION PLACE CATEGORY SIA SITE NO. IMPNDMNTS OAG 73 79 NPDES NO. SIC CODE 0

OPERATIONAL FEATURES OF IMPOUNDMENTS

IMP. NO. PUFPOSE AGE YRS OPEN LAST YR. SURFACE ARFA TOTAL SURFACE IMP. INFLOW YR.OF RECORD (ACRES) (YP) AREA (ACRES) (GALL/DAY) IN OP. WST ST OPA 6 n 0.00 0.00

TOTAL AVE. INFLOW YR.OF TOTAL AVE. EFF. LINER TYPE THICKNESS LIVESTOCK LIVESTOCK IMP. EFFLUENT VR. OF PECORD (GALL/DAY) RECORD (GALL/DAY) (INCHES) NUMBER (GALL/DAY)

0 0 NONE **GROUNDWATER MONITORING** **GPOUNDWATER CONTAMINATION POTENTIAL**
GN GLT HAST MZPU OVERALL GN HEALTH MISC WAST NO. GROUNDWATER GM CHANGES DRINK MATER**UNST GM AVL

WELLS SAMPLE FREG. FROM ANAL. QUAL CHANGS++RTHGECON RATING CON HATING CON RATING CON CONTAM POT. HIRD CON 1D. ID NO ** 3D P 3C H 5 A 7 NONE 18 υĐ 2000

LUCATION OF ASSESSMENT

STATE ID NO. LATITUDE D M S LONGITUDE OWNERS

OPERATOR:

BOW VALLEY EXPLORATIONS

BLUFBELL TER RIM WINTAM BASIN

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FACILITY IDENTIFICATION

CNTY/CITY PLACE CATEGORY SIA SITE NO. IMPUDMNTS NPDFS NO. SIC CODE

DUCHESNE OAG 93 27 0 131

OPERATIONAL FEATURES OF IMPOUNDMENTS

IMP. NO. PURPOSE AGE IN USE YRS OPEN LAST YR. SURFACE APEA TOTAL SURFACE IMP. INFLOW YR.OF RECORD

(YR)

O WST ST ORA O YES

O O O O O

IMP, FFFLUENT YR. OF TOTAL AVE. INFLOW YR. OF TOTAL AVE. EFF. LINER TYPE THICKNESS LIVESTOCK LIVESTOCK (GALL/DAY) RECORD (GALL/DAY) (INCHES) NUMBER TYPE O 0 0 0 NONE 0

GROUNDWATER MONITORING

ND. GROUNDWATER GH CHANGES DRINK MATER**UNST GH AVL GH GLT KAST HZRD OVFFALL GH HEALTH HISC HAST HZRL SAMPLE FREQ FROM ANAL, QUAL CHANGS+*HTNGSCON HATING CON RATING CON HATING CON CONTAM POT HZRD CON ID IC NO NOME

**3D H 3C 5 5 A 7 B 18 OD C 2000

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SUPFACE IMPOUNDMENT ASSESSMENT (STA)

STATE ID NO. DWNERS

DIAMOND SHAMROCK

LOCATION OF ASSESSMENT
LATITUDE D M S LONGITUDE

OPERATOR:

BLUFBELL TES RIN UINTAN BASIN

0

A*FACILITY IDENTIFICATION**

CNTY/CITY PLACE CATEGORY SIA SITE NO. IMPNOMNIS NPDFS NO. SIC CODE

DUCHESNE OAG 95

GPERATIUNAL FEATURES OF IMPOUNDMENTS

MP, NO. PUPPOSE AGF IN USE YHS OPEN LAST YR. SURFACE AHEA TOTAL SURFACE IMP, INFLOM YR.OF RECORD

(YR) IN OP. (ACRES) AREA (ACRES) (GALL/DAY)

0 MST ST ORA 0 YES 0 0 0.00 0.00 0.00

IMP.EFFLUENT YR.DF TOTAL AVE. INFLOW YR.OF TOTAL AVE. FFF. LINEP TYPE THICKNESS LIVESTOCK LIVESTOCK (GALL/DAY) PECGRD (GALL/DAY) (INCHES) NUMBER TYPE

GROUNDWATER MONITORING

ND, GROUNDWATER SH CHANGES DRINK WATER**UNST GM AVL GM GLT MAST MZRD OVERALL GM MEALTH MISC WAST
WELLS SAMPLE PREG FROM ANAL, QUAL CHANGS**HTNG&CCN RATING CON RATING CON CONTAM POT MZRD CUM ID ID NO

NONE

**30 E 30 B 5 A 7 B 18 DD C 2000

SURFACE IMPOUNDMENT ASSESSMENT (SIA) ***********

LOCATION OF ASSESSMENT

STATE ID NO. LATITUDE D M S LONGITUDE UHNERE

DPERATORS

BLUFBELL TZS RIM UINTAH BASIN

SHELL OIL COMPANY

**FACILITY IDENTIFICATION ** CNTY/CITY PLACE CATEGORY SIA SITE NO. IMPNEMNTS NPUES NO. SIC CODE DUCHESNE 131 ** DPERATIONAL FEATURES OF IMPOUNDMENTS **

YRS OPEN LAST YR. SURFACE AREA TOTAL SURFACE IMP. INFLOW YR.OF RECORD IN OP. (ACRES) AREA (ACRES) (GALL/DAY) IMP. NO. PURPOSE AGE IN USE O WST ST OFA G 0.00 0.00

IMP.EFFLUENT YR.OF TOTAL AVE. INFLOK YR.OF TOTAL AVE. EFF. LINER TYPF THICKNESS LIVESTOCK LIVESTOCK (GALL/DAY) (INCHES) NUMBER TYPE (GALL/DAY) RECORD

0 NDNE

SHREACE IMPOUNDMENT ASSESSMENT (SIA)

LOCATION OF ASSESSMENT

STATE ID NO. LATITUDE D M S

OWNER

TEXACO DIL CORPORATION

LOCATION OF ASSESSMENT

OFFICE

OFFICE

BLUFBELL TIS RIP WINTAM BASIN

CHTY/CITY PLACE CATEGORY SIA SITE NG. IMPMONNTS NPDES NO. SIC CODE DUCHFANE DAG 114 3 0 131 ##OPERATIONAL FEATURES OF IMPOUNDMENTS**

IMP. NO. PURPOSE AGE IN USE YRS OPEN LAST YR. SURFACE AREA TOTAL SURFACE IMP. INFLOW YR.OF RECORD

(YR) IN OP. (ACRES) AREA (ACRES) (GALL/DAY)

0 WST ST ORA O YES 0 0 0.00 0.00 0.00

IMP.EFFLUENT YR.OF TOTAL AVE. INFLOW YR.OF TOTAL AVE. EFF. LINER TYPE THICKNESS LIVESTOCK LIVESTOCK (GALL/DAY) RECORD (GALL/DAY) (INCHES) NUMBER TYPE O O NOME O

GROUNDWATER MONITORING

GROUNDWATER GH CHANGES DRINK HATERUNST GH AVL GN DLT **AST MZRD OVERALL GH MEALTH MISC WAST WELLS BAMPLE FREQ FROM ANAL. GUAL CHANGS**PTNG&CCH RATING CON RATING CON CONTAM POT MZRD CON 1D 1D NO 0 NONE ** 4C 6 3C 11 5 A 7 8 19 0D C 2000

STATE ID NO.

OHNERS

LOCATION OF ASSESSMENT
LATITUDE D M S LONGITUDE

OPERATORS

ASAMERA UIL COMPANY

BLUEBELL TIN PZW UINTAH HASIN

O

FACILITY IDENTIFICATION

CNTY/CITY PLACE CATEGORY SIA SITE NU. INPNOMITS DUCHEBNE DAG 116 1

NPDFS NO. SIC CODE

OPERATIONAL FEATURES OF IMPOUNDMENTS

IMP. NO. PURPOSE AGE IN USE YRS OPEN LAST YR. SURFACE AFEA TOTAL SURFACE IMP. INFLOM YR.OF RECORD

(YR) IN OP. (ACRES) AREA (ACRES) (GALL/DAY)

SUMFACE IMPOUNDMENT ASSESSMENT (S14)

0 WST ST OFA 0 YES 0 0 0.00 0.00 0.00 0

IMP.EFFLUENT YR.UF TOTAL AVE. INFLOW YR.OF TOTAL AVE. EFF. LINER TYPE THICKNESS LIVESTOCK LIVESTOCK (GALL/DAY) RECORD (GALL/DAY) (INCHES) NUMRER TYPE

##GROUNDHATER MONITOPING##

NO. GROUNDHATER GK CHANGES DRINK #ATER##UNST GW AVL GW GLT WAST MZRD OVERALL GW HEALTH MISC HAST

MELLS SAMPLE FREG FROM ANAL. QUAL CHANGS##RTNG##CON RATING CON PATING CON CONTAM POT MZRD CON ID ID NO

NONE

** 1E B 1C B 5 A 7 B 14 OD C 2000

1

STATE IN NO.

OWNERS
GULF OIL CORPORATION

LOCATION OF ASSESSMENT
LATITUDE D M S LONGITUDE

OPERATORE BLUFBELL TIN RZW UJUTAN BASIN

0

CNTY/CITY PLACE CATEGORY SIA SITE NO. IMPRODUCTS NEWS NO. SIC CODE

DUCMESNE DAG 120 28 0 131

OFERATIONAL FEATURES OF IMPOUNDMENTS

SURFACE IMPUUNDMENT ASSESSMENT (SIA)

IMP. NO. PUPPOSE AGE IN USE VRS OPEN LAST YR. SURFACE AREA TOTAL SURFACE IMP. INFLOW YR.OF RECORD

(YR) IN (IP. (ACRES) AREA (ACRES) (GALL/DAY)

0 hST ST URA 0 YES 0 0 0.00 0.00 0.00

IMP_EFFLUENT YR.OF TOTAL AVE. INFLOW YR.OF TOTAL AVE. EFF. LINEH TYPF THICKNESS LIVESTOCK LIVESTOCK (GALL/DAY) RECORD (GALL/DAY) PECORD (GALL/DAY) (INCHFS) NUMBER TYPE O O NONE D

GROUNDMATER MONITORING

NO. GROUNDWATER GW CHANGES DRINK MATER**UNST GW AVL GW RLT MAST MZPD OVERALL GW MFALTM MISC MAST WELLS SAMPLE FREG FROM ANAL. QUAL CHANGS***PTNG&CON RATING CON RATING CON CONTAM POT MZRC CON ID ID NO O NOME.

4* 1E 6 1C 8 5 4 7 6 14 0D C 2000

SURFACE IMPOUNDMENT ASSESSMENT (SIA)

LOCATION OF ASSESSMENT
STATE ID NO. LATITUDE D M S LO

STATE ID NO. LATITUDE D M S LONGITUDE OWNERS

CHEVRON DIL COPPORATION

OPERATORS BLUFBELL FIN RIW UINTAM BASIN

CNTY/CITY PLACE CATEGORY SIA SITE NG. IMPNOMMTS NPDES ND. SIC CODE DUCHESNE DAG 126 94 0 131

OPERATIONAL FEATURES OF IMPOUNDMENTS

IMP, NO, PURPOSE AGE IN USE YRS OPEN LAST YR. SURFACE AREA TOTAL SURFACE IMP. INFLOW YR,OF RECORD

(YR) IN OP. (ACRES) AREA (ACRES) (GALL/DAY)

0 WST ST DRA N YES N N 0 0,00 0,00 0

IMP_EFFLUENT YR.OF TOTAL AVE. INFLUM YR.OF TOTAL AVE. EFF. LINEH TYPE THICKNESS LIVESTOCK LIVESTOCK (GALL/DAY) RECORD (GALL/DAY) (INCHES) NUMBER TYPE

##GPOUNDMATER MONITORING**

NO. GROUNDMATER MONITORING**

NO. GROUNDMATER GW CHANGES DRINK MATER**UNST GW AVL GW GLT ### HZRO OVERALL GW HEALTH MISC WAST

WELLS SAMPLE FREG FROM ANAL. QUAL CHANGS&#HING&CON PATING CON RATING CON CONTAM POT MZRO CON ID ID NO

NONE

*## 30 8 30 6 5 5 4 7 8 18 00 0 2 2000

÷ **

SURFACE IMPOUNDMENT ASSESSMENT (SIA)

LOCATION OF ASSESSMENT STATE ID NO.

LATITUDE D M & LONGITUDE

OPERATORS

OWNERS UTEX OIL COMPANY

0

BLUFBELL TIN PIN DINTAH BASIN

FACILITY IDENTIFICATION
CATEGORY SIA SITE NO. IMPNOMNTS
DAG 131 1 PLACE NEDES NO. CHTY/CITY

SIC CODE DUCHESNE 131 **OPERATIONAL FEATURES OF IMPOUNDMENTS**

YRS OPEN LAST YR. SURFACE AFEA TOTAL SURFACE IMP. INFLOW YR.OF RECORD IN OP. (ACRES) AREA (ACRES) (GALL/DAY) AGE PURPOSE (YR) ST ORA 0 0.00 0.06

TOTAL AVE. INFLOW YR.OF TOTAL AVE. EFF. LINER TYPE THICKNESS LIVESTOCK LIVESTOCK IMP EFFLUENT YR. OF RECORD RECORD (GALL/DAY) TYPE (GALL/DAY) (GALL/DAY) (InCHES) NUMBER ٥

GROUNDWATER HONITORING

NO. GROUNDWATER GU CHANGES DRINK WATER**UNST GW AVL GW GLT WAST HZFD UVERALL GW HEALTH MISC
WELLS SAMPLE FREG FROM ANAL. QUAL CHANGS**RTNG&CON RATING CON RATING CON CONTAM POT HZRD CON ID

NONF

** 3D B 3C 8 5 A 7 R 18 OD C 0 FISC MAST ID NO

APPENDIX C

THE FORTRAN PROGRAM FOR LISTING THE ASSESSMENT DATA

STATE

```
START OF SEGMENT GOZ
                                                                                                    FORMAT SEGMENT IS CODE LONG
FORMAT SEGMENT IS COCE LONG
       DIMENSION STAID (3).LAT(3).LONG(3).CHMEF(10).ACDRS(10).CIT4(8)
DIMENSION DTH(3).CUM(5).CHM(5).AUTH(3).CIMEN(3).CTMF(5.m).AUS(2)
                                                                                                        1 6050:500
       DIMENSION LEGIF (7.3), ALMAG(5,2), ALINEF(14,4), IPC(86), FL(86,4)
DIMENSION ALES(10), CTTM(8), OPETA(10), CHT(30,3)
                                                                                                            002:0000:0
                                                                                                           esboortsch
                                                                                                            992:0000:0
       INTEGER ZPCD.ZIP.C.CTY.PLC.SIAGG.SICC.TENS
                                                                                                        ٤.
       GEAL TAPES, ISMAFA
                                                                                                           0.02:01:00:5
                                                                                                           002:0100:0
       PEAG(4,10)((AMSTR(L,1),1#1,3),(#1,7)
                                                                                                           A-2:0000:0
                                                                                                              FIE IS WOOD LONG
                                                                                                            5:5100:510
    10 FOFMAT(6(%#4))
       ##AD(8,20)((ALV#D(M,I),I#1,2),##1,5)
                                                                                                           002:0012:2
                                                                                                           8021902418
   20 FURMAT(5(44,43))
READ(8,30\(DU4(F), **1,5)
       READ(8,34) (DMM(8), 4#1,5)
                                                                                                            002:0031:2
                                                                                                           002:0036:2
    30 FORMAT(SAU)
       REAC(8,40)((CMT(H,J),J=1,3),K=1,29)
    #0 FCRMAT(8(7A4,42))

PEAD(8, B1) (TPL(I),(PL(I,L),LE1,4),IE1,50)

B1 FUR:AT(3(T5,1x,4A4))
                                                                                                           002:0050:2
                                                                                                           002:0050:2
                                                                                                            002:0006:2
        (S. fal. (I) ana) rop, 8104 98
                                                                                                           S:0000;S00
    90 FOWMAT(243)

+tar(6,95)((OTHF(1,J),J=1,4),T=1,3)

95 FIRMAT(3(343,42))
                                                                                                           002:0073:2
                                                                                                            002:0073:2
                                                                                                           002:0085:2
       #: A('(8,9m)((ALINER(1,J),J=1,4),1=1,13)
                                                                                                           002:0085:2
                                                                                                           902:0097:2
    96 FCRHAT(Stuad))
                                                                                                            9 17:0097:2
       FEAD AND APITE THE FIRST PAGE
                                                                                                           442: 10 07:2
                                                                                                           602:0097:2
                                                                                                            402:6897:2
 99
       WEAD(5,110,END#900)STAT,CCCTY,PLC,CAT,SIAMO,ACIMP,(STAID(I),I#1,3)
                                                                                                              fit is cone Long
  1, "FOFS, SICC, (LAT(I), 1x1, 3), (LING(I), Ix1, 3)
110 FORMAT (A2, 13, 15, 43, 15, 4x, 13, 344, 19, 14,
                                                                                                           057100A014
                                                                                                            012:0004:0
                                                    19,14,3A2,A3,2A2)
                                                                                                           002:0064:0
                                                                                                             FIE IS GOOD LONG
  100 FORMAT(*11,46x, *SUPFACE IMPOUNDMENT ASSESSMENT (SIA)*)
                                                                                                            002:00C8:2
  HAITE (6,101)
101 FIRMAT(1 1,485,35(Tet))
                                                                                                            602:0005:2
                                                                                                            002:0000:2
                                                                                                            002:00CC:2
  WEITF (6.102)
102 FORMATER 1,28x, 1++LOCATION (F. ASSESSMENT++1)
                                                                                                           602:00P0:2
        HEAD(5,120)(0+MFP(1),1m1,10),(400R5(1),1m1,10),(CITA(1),1m1,8),CTA T
                                                                                                           ##2: ##£0:2
                                                                                                           fig2:abba:3
  175,71P
120 FURMAT[944,41/944,41/744,42,42,15)
        READ(5,120)(GPRTP(I), J=1,10), (APRS(I), J=1,16), (CTTP(I), J=1,4), STT,
                                                                                                           BUZZENEREZ
       1ZPCE
                                                                                                           0022010620
  002:0110:2
                                                                                                           002:0124:2
                                                                                                           992:0124:2
                                                                                                            5:4510:500
                                                                                                           092:0130:2
  #FITE(6,150)(ADDPS(T),181,10),(ADRS(I),181,10)
150 FOPMAT(57,0A4,1A1,29X,0A4,A1)
#FITE(6,160)(CITW(I),181,8),(CTTW(I),181,8)
                                                                                                           842:0136:2
                                                                                                           002:0150:2
                                                                                                            002:0150:2
   160 FORMAT( 5x,744,42,36x,744,42)
                                                                                                           002:61e3:2
  176 FORMAT(5x, A2.1x, 15, 58x, A2.1x, 15./55x, "++FACILITY IDENTIFICATION",
                                                                                                           002:0168:2
                                                                                                            992:016F:2
                                                                                                           002:0166:2
       THIS COMPLETES THE FIRST PAGE
                                                                                                           002:01eE:2
                                                                                                           002:01bE:2
                                                                                                           002:0168:2
       KFITF(6,180)
  180 FORMAT( 201, OMENTY/CITY, DX. SHPLACE, SX. & PCATEGORY, 2X. 124514 SITE NG., 2X. OMENDMENTS, 5X. OMENDES NG., 5X.
                                                                                                            002:0172:2
                                                                                                           002:0172:2
                                                                                                           002:0172:2
                                                                                                           002:0172:2
                                                                                                            002:0172:2
       WHAT AND WHITE FIRST CARD OF SECOND PAGE
C
                                                                                                           002:0172:2
                                                                                           DEHUG
                                                                                                           092:0172:2
       LHC #PLC/100
                                                                                           PEEUG
                                                                                                           002:0173:5
       IF(LOC.FG., 70)PLC#67000
fo 187 fm; 66
IF (FLC.EG.TPL(I)) GO TO 186
                                                                                                           002:0177:3
                                                                                                           002:0179:0
                                                                                                            n92:0178:0
  187 CIMITINUE
                                                                                           DEEUG
                                                                                                           002:0170:1
       1 = 1
                                                                                                           002:0170:5
  18c h=(CHCTY+1)/2
       IF(CNCTY.FO.0)*#1
IF(PLC.FG.0) I#1
JF(FLC.FG.1)I#1
                                                                                           OFEUG
                                                                                                        Ç
                                                                                                           002:017F:4
                                                                                                           002:0181:3
                                                                                           DESUG
                                                                                                        C
                                                                                                           002:0183:2
        HP17E(6,210)(CNT(K,L),L=1,3),(PL(1,L),L=1,4),CAT,S14NG,NOIMP,NPOES
                                                                                                           002:0165:1
                                                                                                           002:0190:1
      1.5100
```

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C 005:0141:5 C-3
 210 FIRMAT( 22x,24m,42,2x,444,1x,43,4x,15,6x,13,6x,19,7x,14)
                                                                                                       S:1410:500 J
       -FITE(6,220)
 220 FIRMAT( 1 448X, 1 + 40FFBATIGNAL FRATURES OF IMPROMOMENTS ++1)
                                                                                                       U 002:0145:2
                                                                                                           002:0145:2
      FIRE OF FIRST CAFE, SECOND FAGE
READ AND WHITE SECOND CARD, SECOND PAGE
                                                                                                       5 002:#145:2
                                                                                                       C 002:0145:2
                                                                                                           002:01A5:2
                                                                                                          002:4145:2
 200 FURNAT(101,T7, TMP, NO. FURPOSE AGE IN USE YES OPER!,
7: LAST YP. SURFACE APEA TOTAL SURFACE IMP. INFLOW YH.:,
2:OF RECORD!)
                                                                                                          002:0149:2
                                                                                                      2:0410:500 C 002:0149:2
 WFITE(0,261)
201 FORMAT(***,T27,*(YR)**,T50,*IN OP.**,T69,*(ACFES)**,T82,*
                                                                                                          002:0149:2
                                                                                                       E 002:0140:2
     T'ARFA (ACRES) (GALL/DAY)')
IF(PLC.EG.DINDIMP#)
DG 299 I#1,NOIMF
                                                                                                       2:0410:Sp0 D
                                                                                         DEMUG
                                                                                                      C 002:01AF:1
      HEAD (5,240) JHRNO, IMPUR , LOTH(J), J#1,3), LAGE, TUSED, NOVHS, LSTYR, TARE
                                                                                                          002:0180:0
 14,15MARA,1NFAV,IRCD
240 FCPMAT( 18x,13,1x,11,244,43,12,11,12,14,F6,2,F7,2,14,14)
                                                                                                          002:0106:2
                                                                                                      5:1010:500 0
      Gi. TO (274,275), 105E0
                                                                                                       5:1010:500 3
 274 (SEPEANS(1)
      50 10 276
                                                                                                       C #02:0107:3
 275 USECTANECT
                                                                                                         0123016830
 270 CONTINUE
                                                                                                         0:03:0109:0
       IF (JMPUH.GF.3) W TO 272
       JEI-PUP
                                                                                                      F 0051010915
                                                                                                       C 002:0100:0
       IF (TMPUP_ED_0)JE1
 271 -RITE(6,2KO) IMPNO. (OTHE(J.K), KR1.3), IAGE, USED, NOVPS, LSTVR. IAGEA, IS
     SU TO 273
                                                                                                       C 002:01F0:4
                                                                                                      C 002:01F7:2
C 002:01F7:5
 272 MPITE(6,280)IMPNO, (CTH(K), KM1,3), IAGE, USED, NOVAS, LSTVA, IAREA, ISMAR
 1A, 1AFAY, 1PCD
280 FURMAT(: :, T9, 13, T15, 244, 43, 2X, 12, T36, A3, T47, 14, T57, 14, T70, F6, 1,
                                                                                                       L 002:0204:2
                                                                                                      C 005:0511:5
    2185, #7.2, 196, 19, 1114, 14)
 273 CONTINUE
                                                                                                      C 005:0511:5
 290 CONTINUE
#FITE(6,300)
300 FORMAT(101,T7, IMP_FFFLUENT YP.CF TCTAL AVE. THFLCH YP.CF',
?! TOTAL AVE. FFF. LINEF TYPE THICHNESS LIVESTCCK !,
                                                                                                     5:0210217:2
6:0210217:2
7:0210217:2
7:0210217:2
    ?'LTVESTOCK'S
 ## 1TE (0,310)
     #FITE(0,310)

*CRMAT(**,77,*(GALL/CAY) RECORD (SALL/DAY)*,749,

**FECORD (GALL/CAY)*,789,*(IUCHES) NUMBER*,7110,*1YPE*)

CO 399 JIE1,*/OIMP

READ(5,250)JEFAV,JMCT,INFSM,IPCMS,JEFSH,JSKCD,LINER,THRS,(CTHERCIG.
                                                                                                      C 002:0216:2
                                                                                                      C 002:6218:2
   ? * FCURD
                                                                                                          002:0216:2
                                                                                                       C 392:9210:0
 1,121,3),LVSTV,LVKU
250 FCONAT(19,14,19,14,19,14,12,13,344,10,11)
                                                                                                       C 002:0230:2
     IF (LIVER.GE.14) GO TO 329
                                                                                                          002:0230:2
                                                                                                      E 002:0236:4
E 002:0236:3
 327 JELINES
      IF (LINER.FG.6) JEL
                                                                                                          0.15:0581:5
 350 KETAKO
                                                                                                         2021024211
32# 16
          (LYSTK .EQ. 0) 65 TO 3261
                                                                                                      6 605:0543:5
       # ITE (B. 330) JEF 4V. JRCC. THESM. THE U. JEHS" . (ALINEA (J. 1) . 1 = 1.3) .
                                                                                                      t 002:0255:3
     1TH45, LVSTR, (AL VND (R, I), IR1, 2)
      60 TO 300
3281 HRITE(6,331)JEFAV.JRED.INFSM.IRED.JEFS*.(ALINER(J.1).I=1.3).
                                                                                                      6 032:9263:5
                                                                                                      0 002:0275:5
                                                                                                          012:027A:2
GU TO 399
329 IF (LV6TK .FG. 0) GO TO 3291
                                                                                                      6 502:0274:5
      #FITE(0,330)JFF4V,JPC(,1NFS',TPCD,JEFS',(OTHER(I),1=1,3),
                                                                                                      L 002:027C:0
               THRS.LVSTK. (ALVKC(K,1), [#1.2)
                                                                                                      $14P$0:500 )
      60 10 300
3201 ARITE (6.331) JEFAV, JRCI . 15F5M. THCC. JEF5M. (MIHER (1). 1=1.3).
 3 TKMS
330 FGRMAT(* 1,TE,19,T23,34,T33,19,T50,19,T5A,19,T74,344,T91,13,
                                                                                                      C 092:0246:2
                                                                                                      1 002:0246:2
1001047.1714.24.03)
331 FORMAT(* 1,TB,19.722,14,133,19,750,74,758,19,774,344,791,13)
100LUDE EVAPORATION REAFINGS AND CAUCULATIONS IN THE ABOVE ALSO PROINT
END OF SECOND CARD, SECOND PAGE
                                                                                                      C 002:024F:2
                                                                                                       L 032:024F12
                                                                                                          8: 345#:Sen
                                                                                                       S: 745#:540 0
 390 CONTINUE
                                                                                                          1 02: 02AF:2
                                                                                                          002:0201:3
     PEAD AND EPITE THIPD CAPD, SECOND PAGE
                                                                                                          002:0261:3
                                                                                                      r 002:0261:3
                                                                                                      F 005:0591:3
 350 FIRMAT(" ",FX,"**GROUNDWATER MONITORING**",39X, 21**GROUNDWATER CONTAMINATION POTENTIAL***)
 U92:0265:2
                                                                                                      C 002:0265:2
                                                                                                         092:025912
                                                                                                      C 642:0269:2
                                                                                                      #EITE (0.370)
 370 FORMATE 1978 AFELS SAMPLE FREC. FRC: AFAL. GUAL CHANGS+XHT: G&CO:
1 HATING COL PATING CO: PATING CON CONTA: FOT HZRO CC: 10
                                                                                                         4.45:1:260:5
                                                                                                      $136501900
                                                                                                           0.0424545
                                                                                                      7 4451484F15
      DO 499 Jimt. KOIME
     WFAE(5,384))NONWEL, NGASME, (ACTA (K), KM1, 3), TCHG, TOMMAL, UNSTZN, CONU.6
THAYL, CONCHA, GAGNAE, CONGU, HASTE, CONN, GACTPL, HLTHZO, CONH, MISCIG, ION
                                                                                                      ( BB2:B266:3
                                                                                                      C 0"2:0204:5
     251
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£ 7

4 ...

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C-4
      360 FURPAT(12, 11, 344, 11, 11, A2, A1, A2, A1, A1, A1, A1, A1, A2, A2, A1, A3, T4)
                                                                                                                                                                                                                                                                                                             8:1350:200
C
                                                                                                                                                                                                                                                                                                                002:02F0:2
                     THE THE WETTE STATEMENTS FOR THE LAST GATA CARD
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                                                                                                                                                                                                                                                                                                                045:456015
                                                                                                                                                                                                                                                                                                                 002:0360:2
                                                                                                                                                                                                                                                                                                                 5:035u:500
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                       }F [ ( G + 5 - P _ F G _ C ) [ # 1
                                                                                                                                                                                                                                                                                                                 002:02fE:1
                                                                                                                                                                                                                                                                                                                 0:03:0360:0
                       MEICHG
                    IF (ICHG.EQ.O)HE5
                                                                                                                                                                                                                                                                    DEFUG
                                                                                                                                                                                                                                                                                                                  1-7: -2+1:5
                                                                                                                                                                                                                                                                                                                  ma: 2#2:5
      IF(IDREAL_EG.0)&#5
381 IF (4GM5MP_EG.0) GO TO 383
AFITE(6/385)40MML*(AROTH(L*I)*I#1*3), DO*(M)*DMM(*)*UNSTZM*CONL*G -
                                                                                                                                                                                                                                                                                                                 fu2:02F3:4
                                                                                                                                                                                                                                                                                                                  0.2:025514
                                                                                                                                                                                                                                                                                                       ٤
                                                                                                                                                                                                                                                                                                                  002:0247:0
                  1 MAYL, CONGMA, GREDAL, CONGRAMASTE, CORM, GROTPL, MLTMZD, COMM, MISCIO, IDMS T
                                                                                                                                                                                                                                                                                                                  002:030A:3
                                                                                                                                                                                                                                                                                                                  002:0319:3
                     GU TO 389
                                                                                                                                                                                                                                                                                                                  nu2:"316:2
   383 CONTINUE
                                                                                                                                                                                                                                                                                                                  062:03:0:5
      #FITE(0,3P5)NOMNHL,(ADTF(I),I±1,3),DLM(M),UMM(N),UMSTZN,CONM,GHAVL ,
1,CONGWA,G-GUAL,CONGG,HASTF,CONH,G-CTPL,HLTHZD,CONH,HISCID,IDHST
365 FOPMAT(2x,12,3x,3A4,5x, ag,9x, aq,3x,2H**,1x,42,3x,a1,4x,a2,5x,a1,
                                                                                                                                                                                                                                                                                                                  692:0310:5
                                                                                                                                                                                                                                                                                                                 6 (2:6330:1
6:2::343:2
6:2::343:2
                                                                                                                                                                                                                                                                                                       c
                                             C #1,x5,Ea,xE,ta,x2,54,x6,52,x2,14,x0,14,x0,14,x7,14,X7
Ç
                                                                                                                                                                                                                                                                                                                 0/2:134312
                     FNO OF THIPD CARD. SECOND PAGE
                                                                                                                                                                                                                                                                                                                E-2: 343:2
                                                                                                                                                                                                                                                                                                              002:0343:2
002:0343:2
002:0345:3
      389 CONTINUE
                                                                                                                                                                                                                                                                                                       С
     Des CONTINUE

GO TO 99

GO
                                                                                                                                                                                                                                                                                             SEGMENT OF 2 IS 038F LONG
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The File 8 Listing Read in the Program

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NONE
                                                                              HEEKLY
                                                                                                        MONTHLY QUARTERLY SEMIANNUALLY
                                                DAILY
                YEARLY
     YEARLY
CATTLE HOGS SHEEP POULTRY
YEB NO UNKN N/A
YEB NO UNKN N/A
BEAVER BOX ELDER CACHE CARBON
GARFIELD GRAND IRON JUAB
RICH BALT LAKE SAN JUAN SAN PETE
UTAM HABATCH HASHINGTON HAYNE
                                                                                                                     DAGGET
                                                                                                                                                DAVIB
                                                                                                                                                                         DUCHESHE EMERY
                                                                                                                  KANE .
BEVIER
                                                                                                                                            MILLARD
                                                                                                                                                                           HURGAN
TOOELE
                                                                                                                                                                                                      HINTAH
  00700 ALTAMONT 01530 ANETH
03950 BEAR RIVER CITY 04060 BEAVER
00920 BDNANZA 08790 BRYCE CANYUN
11320 CEDAR CITY
11870 CENTERFIELD 15720 COPPERTON
18910 DELTA 20340 DUCHESNE
                                                                                                                          03290 BACCHUB
06370 BLANDING
10660 CASTLE DALE
                                                                                                                                                                                                      و جهور
                                                                                                                          15830 CORINNE
20450 DUGHAY(DUGHAY PROVING GRDUND)
24050 EUREKA
20610 FURT DUCHESNE
32660 GUNNISON
     23090 EMDRY 23530 EFHRAIH
25180 FERRUN 25510 FILLHORE
30790 GRANGER-HUNTER 31120 GRANTSVILLE
34200 MEBER
34640 HENEFER 34970 MERRIMAN
37660 HUNTSVILLE 37170 HUPRICAME
39810 KAMAS 42810 LAPE
 23090 EMORY
                                                                                                                                                                                               . .
                                                                                                                           36959 HUNTINGTON
                                                                                                                          37500 HYRUM
42560 LAKETOWN
      39810 KAMAS
43000 LARK
49320 LEHI
47290 HAGNA
69710 MIDVALE
50700 MDAB
54110 NEDLA
54220 NEPHI
57300 DREM
60710 BLAIN CT
                                                                                                                          45860 LOGAN
49270 MEXICAN HAT
50590 HINEHBVILLE
52130 MORONI
                                                                44760 LEHISTON
47620 MANILA
50040 HILFORD
                                                                51910 HOHGAN
$4110 NEDLA
$420 NEPHI $5210 NORTH SALT LAKE $5650 DAKLEY
$7300 DREM $58510 PAPOMAN $59390 PERRY
$60710 PLAIN CITY $2470 PROVO $3680 RICHMOND
$44670 ROUSEVELT $5880 SALINA $7000 SALT LAKE CITY
$6740 SANDY $6850 SIGURD $9640 SMITHFIELD
$72720 STANSBURY PARK $74370 SUNNYSIDE
$76790 TOOELE ARMY DEPO77560 TPOPIC $0090 VERNAL
$1960 MASHINGTON $2620 MELLSVILLE $2730 MENDOVER
$49160 MHITEROCKS $4710 WILLARD $5370 MOODS CROSS
       YESHO
       HST STORAGENST DISPOSENST TREATHT
NONE CLAY BENTONITE MODIFOCHEM MODIFO CLAY CONCRETE HETAL POLYETHYLENE PLASTICIZED PYCBUTYL RUBBER SHIHYPALON SHEETING ETHYSEN PROPYLENCHLOR POLYETHYLN
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APPENDIX D

RESUMES OF THE PROFESSIONAL STAFF

DONALD B. PORCELLA

Associate Director Utah Water Research Laboratory Utah State University

Dated: 1/01/79

Date and Place of Birth

October 2, 1937

Modesto, California

Education

A.B. Zoology, University of California, Berkeley, 1959
M.A. Zoology, University of California, Berkeley, 1961
Ph.D. Environmental Health Science, University of California,
Berkeley, 1967

Post Doctoral Fellow, Fulbright, Norway, 1967-1968 Sabbatical, USEPA, Corvallis, Oregon, 1976-1977

Teaching Experience

1963-65	University of California, Berkeley (teaching assistant)
1966	University of California, Berkeley (one graduate course)
1970-72	Assistant Professor, Utah State University, Logan
1972-1978	Associate Professor, Utah State University, Logan
1978-present	Professor, Utah State University, Logan

Administrative Experience

1974-76 Head, Division of Environmental Engineering, Utah State University, Logan
1977-present Associate Director, Utah Water Research Laboratory, Logan

Research Experience

1960-61	Research Assistant, SERL, University of California,
	Berkeley
1961-63	Research Zoologist, USPHS, R. A. Taft Sanitary Engrg.
	Center, Cincinnati, Ohio
1963-65	Research Zoologist, SERL, University of California,
1703 03	Berkeley
1967-68	Postgraduate Fellow, Norwegian Institute for Water
	Research, Oslo, Norway
1968-70	Assistant Research Zoologist, SERL, University of
	California, Berkeley, and Lake Tahoe Area Council,
	South Lake Tahoe, California
1970-present	Assistant and Associate Professor, UWRL, Utah State
-	University, Logan, Utah
1976-77	Research as IPA-Fellow, U.S. Environmental Protection
	Agency, Corvallis Environmental Research Laboratory,
	- · · · · · · · · · · · · · · · · · · ·
	Corvallis, Oregon

Major Research Projects

1963-67	Radionuclide Uptake by Algae and Zooplankton - AEC
1968-70	Provisional Algal Assay Procedures - EPA
1968-70	Eutrophication of Surface Waters - Lake Tahoe - EPA
1969-present	Eutrophication of Surface Waters - Indian Creek
	Reservoir - EPA
1970-73	Temperature-Toxicity - OWRR
1969-74	Mud-Water Nutrient Interactions - AEC and OWRR
1972-74	Phosphorus Management - EPA
1970-present	Various Projects Associated with Eutrophication - NL
	Ind, Procter and Gamble, Utah Water Research Laboratory
1970-76	In charge of Water Quality Laboratory and Services, Utah
	Water Research Laboratory
1973-present	Organic Molecules in Freshwater Environments and Eco-
_	system Modeling
1973-present	Waste Load Allocation and River Basin Modeling - State
	of Utah
1974-present	Reclaiming Mine Spoils - nitrogen fixation, algae,
	bactería. USFS
1975	Colorado River Basin Regional Study for the NCWQ. NCWQ
1975	Minimum Stream Flow and Water Quality. USFWS
1976-present	Lake Restoration - USEPA
1977-present	Ames Test Applied to Aquatic Ecosystems
1978-present	Urban Runoff Impacts on Stream Communities
1978-present	Groundwater Contamination Studies
1978-present	Environmental Indices

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Books

Comprehensive Management of Phosphorus Water Pollution. Ann Arbor Science Publ. Inc. 1975. 320 p. (* and A. B. Bishop)

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Review Paper: The Effect of Carbon on Algal Growth--Its Relationship to Eutrophication. Water Research, 6:637-679. 1972. (J. C. Goldman, *, E. J. Middlebrooks, and D. F. Toerien)

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Continuous Flow (Chemostat) Assays. Proceedings of the Eutrophication-Biostimulation Assessment Workshop (Middlebrooks et al., editors) SERL, University of California, Berkeley, California. 1969. pp. 7-22. (*)

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Eutrophication of Surface Waters - Indian Creek Reservoir. Final Report for Grant No. 16010 DNY. 1971. 115 pp. (P. H. McGauhey, G. L. Dugan, and *)

Eutrophication of Surface Waters - Lake Tahoe. Final Report for Grant No. 16010DSW 05/71. 1971. 154 pp. (P. H. McGauhey, G. L. Dugan, and *)

Detergent and Non-detergent Phosphorus in Sewage. Final Report to Procter and Gamble. Unpublished Report. 1971. 68 pp. (* and E. J. Middlebrooks)

Effects of Land Use on Water Quality: Summit Creek, Smithfield, Utah. Utah Water Research Laboratory, Utah State University, Report No. PRWR17-1. 1972. 43 pp. (D. W. Meyers, E. J. Middlebrooks, and *)

Great Salt Lake Brine Shrimp Investigation. Final Report on Algal and Chemical Analyses. To NL Industries. Unpublished Report. 1972. 57 pp. (*, P. A. Cowan, M. Virmani, and D. R. Johann)

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Nitrogen and Carbon Flux in a Soil-Vegetation Complex in the Desert Biome. Annual Report, USIBP Program. 1972. (*, J. E. Fletcher, D. L. Sorensen, G. C. Pidge, and A. Dogan)

Ecological Implications of Dimethyl Mercury in an Aquatic Food Chain. Utah Water Research Laboratory, PRWG105-2, Utah State University, Logan, Utah. June 1973. (L. P. Kolb, *, and E. J. Middlebrooks)

Chemical and Biostimulatory Properties of Cattle Feedlot Runoff. Agricultural Experiment Station, Utah State University, Logan, Utah, November 1973. (D. S. Filip, E. J. Middlebrooks, and *)

Effects of Temperature on the Toxicity to the Aquatic Biota of Waste Discharges--A Compilation of the Literature. Utah Water Research Laboratory, PRWG105-1, Utah State University, Logan, Utah. 170 pp. October 1973. (M. J. Gaspar, R. D. Gaspar, J. H. Reynolds, E. J. Middlebrooks, and *)

Effects of Baffles on the Performance of Anaerobic Waste Stabilization Ponds. Utah Water Research Laboratory, PRWR17-2, Utah State University, Logan, Utah. April 1973. (S. B. Nielson, E. J. Middlebrooks, and *)

Comprehensive Management of Phosphorus Water Pollution. EPA-600/5-74-010. Final Report to the EPA, Washington, D.C. 20460. February 1974. 411 p. (* and 10 other authors)

Review Paper: Evaluation of Techniques for Algae Removal from Waste-water Stabilization Ponds. Utah Water Research Laboratory, PRJEW115-1, Utah State University, Logan, Utah. January 1974. 20 p. (E. J. Middlebrooks, *, R. A. Gearheart, G. R. Marshall, J. H. Reynolds, and W. J. Grenney)

Component Description of Sediment-Water Microcosms. Utah Water Research Laboratory, PRWG121-2, Utah State University, Logan, Utah. June 1974. 45 p. (J. Hill IV and *)

A Continuous Flow Kinetic Model to Predict the Effects of Temperature on the Toxicity of Waste to Algae. Utah Water Research Laboratory, PRWG105-3, Utah State University, Logan, Utah. June 1974. 112 p. (J. H. Reynolds, E. J. Middlebrooks, *, and W. J. Grenney)

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Nitrogen and Carbon Flux in the Desert Biome. Presented at the Annual Meeting of the NSF/Desert Biome, Tempe, Arizona. March 1973.*

Attended Gordon Research Conference on Trace Materials in Aquatic Environments: Aquatic Oligodynamics. June 30 - July 5, 1974, New Hampshire.*

Effects of Temperature Variation on Kinetic Growth Constants of Selenastrum capricornutum in NH₄-N Limited Continuous Cultures. 37th Annual Meeting, American Society of Limnology and Oceanography. (*, J. H. Reynolds, E. J. Middlebrooks, and W. J. Grenney). June 1974.

Gas Analysis of a Microcosm Community as an Index of Microbial Activity. 37th Annual Meeting, American Society of Limnology and Oceanography. (*, V. D. Adams, P. A. Cowan, and W. J. Grenney)

Artificial Destratification Affects Microbial Community in an Eutrophic Lake. 37th Annual Meeting, American Society of Limnology and Oceanography. (*, D. D. Drury, and R. A. Gearheart)

The Role of Scientists in Developing Water Quality Management Models. 37th Annual Meeting, American Society of Limnology and Oceanography. (* and W. J. Grenney)

Ecosystem Modeling. Proceedings of the 5th Conference on Environmental Toxicology. University of California, Irvine, Toxic Hazards Research Unit, Dayton, Ohio 45431. September 1974. (W. J. Grenney and *)

Ecosystem Modeling. Proceedings of the 5th Annual Conference on Environmental Toxicology. Aerospace Medical Research Laboratory, Wright-Patterson Air Force Base, Ohio 45433. December 1974. (W. J. Grenney and *)

A Description and Preliminary Users Guide to the Desert Biome Stream Ecosystem Model. US/IBP: Desert Biome. (with J. H. Wlosinski, G. W. Minshall, C. W. Fowler, D. W. Goodall, R. W. Jeppson, *, and C. B. Stalnaker). In press.

Microbial Activity in a Microcosm Community as Monitored by Gas and Nutrient Analysis. Presented at the First Chemical Congress of the North American Continent, Mexico City, Mexico, November 30 - December 5, 1975. (*, V. D. Adams and P. A. Cowan)

Component Modeling: A Different Approach to Represent Biological Growth Dynamics. Presented at the Division of Environmental Chemistry, American Chemical Society, Philadelphia, PA., April 1975. (* and W. J. Grenney)

Water Quality Model Application to Green River, Utah. Seminar on Colorado River Basin Modeling Studies, Utah State University, Logan, July 16 - 18, 1975. (* and W. J. Grenney)

Suspended and Dissolved Solids Effects on Freshwater Biota. Sediment Problems in the Northwest. Seattle, Washington, March 1977.

Potential Effects of Oil Shale Residues on Phytoplankton Productivity in the Colorado River System. 41st Annual Meeting, ASLO, Victoria, B.C., June 1978. (Mary L. Cleave, V. D. Adams, and *)

Nutrient Inactivation by Al(III): Response and Evaluation in a Sediment-Water-Gas Microcosm. 41st Annual Meeting, ASLO, Victoria, B.C., June 1978. (A. J. Medine, *, V. D. Adams, D. B. George)

Consulting Experience

1969 California Department of Water Resources (Subcontract

to S. Scher, El Cerrito, California)

1969-present Environmental Science Associates, Burlingame, California

1970-present Bechtel Corp., San Francisco, California 1971-present Procter and Gamble, Inc., Cincinnati, Ohio Thiokol Corp., Brigham City, Utah 1971, 1973 California Department of Water Resources (Subcontract 1972 to E. J. Middlebrooks, Logan, Utah) 1972-present Lake Tahoe Area Council, So. Lake Tahoe, California 1973-present Utah State University Foundation, various projects 1974, 1977 Kennecott Copper Corp., Salt Lake City Intermountain Consultants & Planners, Logan, Utah 1975-present Mountainlands Association of Governments, Provo, Utah 1975 Environmental Engineering Manpower Study for EPA (E. J. 1975 Middlebrooks) 1975 Monsanto Corporation, Soda Springs, Idaho 1977-78 South Tahoe Public Utilities District, S. Lake Tahoe, 1978 Tetra Tech, Inc., Lafayette, California

Scientific and Professional Societies

American Association for the Advancement of Science American Society of Limnology and Oceanography Utah Water Pollution Control Association International Association of Water Pollution Research Association of Environmental Engineering Professors American Society of Microbiologists Utah Academy of Sciences, Arts and Letters

Participation in Professional Organizations

Member of the subcommittee on Aquatic Biology of the Clinch River Study Steering Committee, 1961-1963

Member of the Provisional Algal Assay Procedures Evaluation Committee, 1969-1970

Member of the American Water Works Association Subcommittee on Water Quality Control in Reservoirs, 1969-date

Member of the Northern California Committee on Environmental Information, Subcommittee on Water Quality, 1969-70

Member of Committee to Develop Algal Assay Procedures for the 14th Edition of Standard Methods

Member of Ad Hoc Committee to set up registration for Environmental Analysis Laboratories, Utah State Health Department

Member of Subcommittee of Phytoplankton of the Committee on Methods for Toxicity Tests with Aquatic Organisms

Associate of the Ecology Center, Utah State University, Logan, Utah

Listed in "Fishery Limnologists" FAO, Geneva, Switzerland

Arrangements Committee for Environmental Biogeochemistry Symposium

Member of Committee on Modeling Aquatic Environments, Desert Biome, USU

Presider: "Trace Metals in the Environment," American Society of Limnology and Oceanography, Salt Lake City, Utah

Member of Land Use Planning Committee, Environment and Man, USU

Seminar, Case Western Reserve Univ., Cleveland, Ohio, "Development of Strategies for Phosphorus Management"

Great Salt Lake Interagency Team, Utah State Legislative Council

Member, Standard Methods Committee, Water Pollution Control Federation. 1973-date

Chairman, WPCF Subcommittee on Bioassay Methods. 1975-date. Prepared 15th Edition, PART 800, Standard Methods, 200 pp.

Reviewer, Water Pollution Control Federation, U.S. Environmental Protection Agency, International Association for Water Pollution Research, National Science Foundation

Presider, Microbial Interactions; ASLO, 37th Annual Mtg. June 1974, Seattle, Washington

Member, Utah Advisory Council on Science and Technology: Environmental Advisory Committee, Salt Lake City, Utah, 1975

Accomplishments, Honors, Etc.

California State Scholarship, 1957-59
USPHS Traineeship, 1965-67
Fulbright Post-Graduate Fellow, 1967-68
Delta Omega (Honorary Public Health), 1968
Sigma Xi, 1968
American Men and Women of Science, 1972
Outstanding Researcher, College of Engineering, 1973

V. DEAN ADAMS

Associate Professor and Head of the Division of Environmental Engineering Utah Water Research Laboratory Utah State University

Dated: 2/4/80

Date and Place of Birth

March 9, 1944

Grace, Idaho

Degrees

B.S. Chemistry, Idaho State University, Pocatello, Idaho,

1966

Ph.D. Organic Chemistry, Utah State University, Logan,

Utah, 1972

Teaching Experience

1969-1972	Utah State University, Logan, Utah (Teaching Assistant)
1968-present	Utah State University, Logan, Utah (Extension Class)
1975-present	Division of Environmental Engineering (Water Quality
	Analysis) Utah State University, Logan, Utah

Administrative Experience

1974-present Supervisor, Environmental Water Quality Laboratory, Utah Water Research Laboratory, Utah State University, Logan,

Utah

1979-present Head of Division of the Environmental Engineering, Utah

State University, Logan, Utah

Research Experience

1966-1972	Graduate Student and Research Assistant, Utah State
	University, Logan, Utah
1972-1973	Post-doctoral Fellow, Utah Water Research Lab., Utah
	State University, Logan, Utah
1973-1975	Research Chemist, Utah Water Research Lab., Utah
	State University, Logan, Utah
1975-1978	Research Assistant Professor, Utah Water Research Lab.,
	Utah State University, Logan, Utah
1978-1979	Research Associate Professor, Utah Water Research Lab.,
	Utah State University, Logan, Utah
1979-present	Associate Professor and Head of the Division of Environ-
	mental Engineering, Utah State University, Logan, Utah

Major Research Projects

1967-1972	Synthesis of Dihydropyrenes and New Synthetic Methods for 4(3H)-Pyrimidinones
1972-1974	Biological Effects of Interchange of Metals and of

1972-1973	Identification of Organic Compounds in a Closed-Loop Hypochlorite Wastewater Treatment System
1973-1979	Isolation, Identification and Role of Specific Natural Organic Compounds in Regulating Photosynthetic
	Heterotrophic Relationships
1973-1974	Microbial Degradation of Herbicides
1973-1974	Waste Load Allocation in the Bear, Sevier, and Virgin River Basins of Utah
1975-1979	The Biological Role of Specific Organic Compounds in Aquatic Ecosystems Produced by Oil Shale Development
1977-1978	Awarded National Science Foundation Specialized
	Research Equipment Grant (Autoanalyzer for Automated Water Quality Analysis)
1977-present	Identification of Presumptive Carcinogenic Compounds
F	Released to Water Supplies by Oil Shale Development
1977-1979	Chemical and Biological Analysis of Water Samples
	Collected from Bureau Projects in Colorado
1977-1979	Nutrient Inactivation by Al(III): Response and
	Evaluation in a Hyrum Reservoir Microcosm
1977-1979	Residual Heavy Metal Removal by Wastewater Grown-Algae-
	Intermittent Sand Filtration System
1978-present	Safe Drinking Water-Surface Impoundment Assessment
1978-present	Groundwater Contamination in Alluvial Fan Aquifers
1978-present	Use of Saline Water in Energy Development
1978-present	Assessment of the Problem of Chlorinated Hydrocarbons
	and Evaluation of Ozonation as an Alternative to
	Chlorination
1978-present	Water Requirements and Pollution Potential of Gas
	Production from Lignite Shale
1978-present	Implementation of an Environmental Bioassay Center
1978-present	Calcium Carbonate Precipitation in Streams as Controlled
	by Physical-Biological Reactions
1979-present	Performance Evaluation of SO ₂ Disinfection
1979-present	Environmental Fate and Effect of Polynuclear Aromatic
	Hydrocarbons in Aquatic Systems
1979-present	The Response of Fresh Water Ecosystems to Allochthonous
	Organic Material
1979-present	Natural Salinity Precipitation Processes
1979-present	Laboratory Evaluation of Groundwater Leachate from Power
	Plant Fly and Bottom Ash

Consulting Experience

1973-1974	USU Foundation (Waste Load Allocation)
1974	Campbell Scientific (Combustion Gas Analysis)
1977-present	E. J. Middlebrooks & Associates (South Tahoe Public
	Utility District, Waste Treatment Facility)
1977-1979	W. F. Sigler & Associates (Pyramid Lake)
1977-present	International Environmental (Waste Treatment Facility)
1979-present	Utah Wildlife Resources Division (Hatchery Wastes)

Scientific and Professional Societies

American Chemical Society
Member of the Division of Environmental Chemistry
Member of the Division of Analytical Chemistry
Water Pollution Control Federation
Utah Water Pollution Control Association
Chairman, Student Activity Committee, 1979

Accomplishments and Honors

Honors Scholarship, Idaho State University, 1962-1963 NDEA Fellowship, Utah State University, 1966-1969 Selected to Outstanding Young Men of America, 1979

Participation in Professional Organizations

Selected to the Joint Task Group, Organic Contaminants for the 15th Edition of Standard Methods. 1975-present.

Invited participant of the workshop entitled "An Ecosystem's View of Organic Contamination," sponsored by the Institute of Ecology, Monterey, California. 1975.

Invited participant to the Gordon Research Conference, Environmental Sciences: "Organic Materials in Water," Andover, New Hampshire. 1976.

Invited participant to the Gordon Research Conferences, Environmental Sciences: "Reaction and Fates of Organics in Natural Waters," Plymouth, New Hampshire. 1978.

Publications

Dissertation--Approaches to the Synthesis of trans-15, 16-Dimethyl-2, 7-Diaza-15, 16-Dihydropyrenes and a New Synthesis of 4(3H)-Pyrimidinones

Improved Synthesis of 4(3H)-Pyrimidinones. Synthesis 4:286-288, 1974. (with R. C. Anderson)

Organic Residue in a Closed-Loop Hypochlorite System. 29th Annual Purdue Industrial Conference, 1974. (with E. J. Middlebrooks and P. N. Nance)

Organic Residue in a Recycled Effluent, Part I, Water and Sewage Works, 122, 6, 82-83, 1975. (with E. J. Middlebrooks and P. D. Nance)

Organic Residue in a Recycled Effluent, Part II, Water and Sewage Works, 122, 7, 98-99, 1975. (with E. J. Middlebrooks and P. D. Nance)

Sediment-Water Microcosms for Assessment of Nutrient Interactions in Aquatic Ecosystems. Biostimulations and Nutrient Assessment. E. J. Middlebrooks, D. H. Falkenborg, and T. E. Maloney, editors, Ann Arbor Science, 1975. (with D. B. Porcella and P. A. Cowan)

Residual Heavy Metal Removal by an Algae-Intermittent Sand Filtration System. Water Research, 13,3,305-313, 1979. (with D. S. Filip, T. Peters, and E. J. Middlebrooks)

Heavy Metal and Nutrient Effects on Sediment Oxygen in Three-Phase Aquatic Microcosms, VIth Ecological Research Symposium, Microcosms in Ecological Research (J. P. Geisy, ed). (with A. J. Medine and D. B. Porcella) (In press)

Isolation and Identification of Organic Residues from Processed Oil Shale. 21st Oil Shale Symposium. (with D. L. Maase, D. B. Porcella, and D. L. Sorensen) (In press)

Detection of Chemical Mutagens in Extracts of Spent Oil Shale Using the Ames Test. 21st Oil Shale Symposium. (with J. G. Dickson, J. H. Manwaring, D. L. Sorensen, and D. B. Porcella) (In press)

Oil Shale Development and the Phytoplankton of Lake Powell. (Accepted to ES&T) (with M. L. Cleave and D. B. Porcella)

The Application of Batch Bioassay Techniques to the Study of Salinity Toxicity to Freshwater Phytoplankton. Submitted to Water Research. (with M. L. Cleave and D. B. Porcella)

Quantitative Determination of Trace Concentrations of Volatile Organic Compounds in Natural Water Systems. (In preparation)

Naturally Occurring Volatile Organic Compounds in a Eutrophic Reservoir. (In preparation)

Technical Reports

Identification of Organic Compounds in a Closed-Loop Hypochlorite Wastewater Treatment System. Final Report to Thiokol Chemical Corp. Utah Water Research Laboratory, Utah State University, Report No. 3821, 27 p. (with E. J. Middlebrooks) 1973.

Biological Treatment of the Phenoxy Herbicides 2, 4-D and 2, 4, 5-T in a Closed System. Report to United States Air Force. Utah Water Research Laboratory, Utah State University (with A. M. Wachinski and J. H. Reynolds) 1974.

I. Planning for Water Quality in the Bear River System in the State of Utah. II. Planning for Water Quality in the Sevier River System in the State of Utah. III. Planning for Water Quality in the Virgin River System in the State of Utah. Utah Water Research Laboratory, Utah State University, PRWG142-1, 2, 3. Also six Wasteload Allocation Preliminary Reports; two each on the Bear River, the Sevier River, and the Virgin River. (with E. J. Middlebrooks and other staff of the Utah Water Research Laboratory) 1974.

Nutrient Dynamics and Gas Production in Aquatic Ecosystems: The Effects and Utilization of Mercury and Nitrogen in Sediment-Water Microcosms. Utah Water Research Laboratory, Utah State University, Report No. PRWG-121-1. (with D. B. Porcella, P. A. Cowan, S. Austrheim-Smith, W. F. Holmes, J. Hill IV, W. J. Grenney, and E. J. Middlebrooks) 1975.

Iron Dynamics in a Gas-Water-Sediment Microcosm. Utah Water Research Laboratory, Utah State University (with P. A. Cowan and D. B. Porcella) 1976.

Naturally Occurring Organic Compounds and Algal Growth in a Eutrophic Lake. Utah Water Research Laboratory, Utah State University, Report No. PRWG-137-1. (with R. R. Renk, P. A. Cowan, and D. B. Porcella) 1976.

Ecosystem Processes and Organic Contaminants: An Interdisciplinary Synthesizing Workshop for the Institute of Ecology, National Science Foundation, Report No. NSF-RA-760008. (with many authors) 1977.

South Tahoe Public Utility District Effluent Effects on Indian Creek Reservoir. Middlebrooks & Associates, Inc., Logan, Utah. (with D. B. Porcella and E. J. Middlebrooks) 1978.

Naturally Occurring Organic Compounds in Eutrophic Hyrum Reservoir, Utah. Utah Water Research Laboratory, Utah State University, Report No. Q-78-001 (with R. R. Renk and D. B. Porcella) 1978.

Specialized Research Equipment. Final Report to the National Science Foundation No. ENG76-05895. Utah Water Research Laboratory, Utah State University. (with D. L. Sorensen and P. A. Cowan). 1978.

Assessment of Possible Carcinogenic Hazards Created in Surrounding Ecosystems by Oil Shale Developments. (In preparation)

Pre-Impoundment Water Quality Study for the Mancos Project. Report to United States Bureau of Reclamation, Utah Water Research Laboratory, Utah State University (with L. A. Baker, J. S. Fifield, L. G. Terry, D. L. Sorensen). 1979.

Pre-Impoundment Water Quality Study for the San Miguel Project. Report to United States Bureau of Reclamation, Utah Water Research Laboratory, Utah State University (with L. A. Baker, J. S. Fifield, L. G. Terry, D. L. Sorensen). 1979.

Pre-Impoundment Water Quality Study for the Dolores Project. Report to United States Bureau of Reclamation, Utah Water Research Laboratory, Utah State University (with L. A. Baker, J. S. Fifield, L. G. Terry, D. L. Sorensen). 1979.

Pre-Impoundment Water Quality Study for the McElmo Project. Report to United States Bureau of Reclamation, Utah Water Research Laboratory, Utah State University (with L. A. Baker, J. S. Fifield, L. G. Terry, D. L. Sorensen). 1979.

Pre-Impoundment Water Quality Study for the West Divide Project. Report to United States Bureau of Reclamation, Utah Water Research Laboratory, Utah State University (with L. A. Baker, J. S. Fifield, L. G. Terry, D. L. Sorensen). 1979.

Pre-Impoundment Water Quality Study for the Dominguez Project. Report to United States Bureau of Reclamation, Utah Water Research Laboratory, Utah State University (with L. A. Baker, J. S. Fifield, L. G. Terry, D. L. Sorensen). 1979.

Algal Bioassay Study for the Dolores Project, Dominguez Project, San Miguel Project and West Divide Project. Report to United States Bureau of Reclamation. Utah Water Research Laboratory, Utah State University (with L. G. Terry) 1979.

Algal Bioassay Study for the Animas-La Plata Project. Report to United States Bureau of Reclamation. Utah Water Research Laboratory, Utah State University (with L. G. Terry) 1979.

Evaluation of Sulfur Dioxide Disinfection. Report to International Environmental Inc., Utah Water Research Laboratory, Utah State University (with J. H. Reynolds) 1979.

Laboratory Evaluation of Groundwater Leachate from Power Plant Fly and Bottom Ash. Report to NERCO, Utah Water Research Laboratory Utah State University, 1979.

Papers Presented at National and International Meetings

Gas Anaysis of a Microcosm Community as an Index of Microbial Activity. 37th Annual Meeting, American Society of Limnology and Oceanography. Seattle, Washington (with D. B. Porcella, P. A. Cowan, and W. J. Grenney). 1974.

Organic Residue in a Closed-Loop Hypochlorite System. 29th Annual Purdue Industrial Waste Conference. West Lafayette, Indiana (with E. J. Middlebrooks and P. D. Nance) 1974.

Sediment-Water Microcosms for Assessment of Nutrient Interactions in Aquatic Ecosystems. Biostimulation and Nutrient Assessment Symposium. Workshop, Utah State University. (with D. B. Porcella and P. A. Cowan) 1975.

Microbial Activity in a Microcosm Community as Monitored by Gas and Nutrient Analysis. Presented at the First Chemical Congress of the North American Continent, Mexico City, Mexico (with D. B. Porcella and P. A. Cowan) 1975.

Naturally Occurring Organic Compounds and Algal Activity in a Eutrophic Reservoir, 57th Annual Meeting Pacific Division, American Association for the Advancement of Science, Missoula, Montana. (with R. R. Renk and D. B. Porcella) 1976. Naturally Occurring Trace Organic Compounds Found in Mountain Streams, Freshly Fallen Snow and a Eutrophic Lake, 172nd American Chemical Society Meeting, San Francisco, California. (with R. R. Renk and D. B. Porcella) 1976.

Possible Salinity Effects of Oil Shale Development in Utah and the Colorado River System, 57th Annual Meeting, Pacific Division American Association for the Advancement of Science, Missoula, Montana. (with M. L. Cleave and D. B. Porcella) 1976.

Effects of Increased Common Salt Ions on the Productivity of a Diatom Indigenous to the Colorado River System, 58th Annual Meeting Pacific Division, American Association for the Advancement of Science, San Francisco, California. (with M. L. Cleave and D. B. Porcella) 1977.

Effects of Increased Common Salt Ions on the Productivity of Phytoplankton Indigenous to the Colorado River System, IXth International Seaweed Symposium, Santa Barbara, California. (with M. L. Cleave and D. B. Porcella) 1977.

Heavy Metal and Nutrient Effects on Sediment Oxygen Demand in Three-Phase Aquatic Microcosms, Symposium on Microcosms in Ecological Research, Atlanta, Georgia (with A. J. Medine and D. B. Porcella) 1978.

Nutrient Inactivation by Al(III): Response and Evaluation in a Sediment-Water-Gas Microcosm. 41st Annual Meeting, American Society of Limnology and Oceanography, Victoria, British Columbia. (with A. J. Medine, D. B. Porcella, and D. B. George) 1978.

Potential Effects of Oil Shale Residues on Phytoplankton Productivity in the Colorado River System. 41st Annual Meeting of American Society of Limnology and Oceanography, Victoria, British Columbia. (with M. L. Cleave and D. B. Porcella) 1978.

Detection of Chemical Mutagens in Extracts of Spent Oil Shale Using the Ames Test. Oil Shale Symposium Sponsored by Environmental Protection Agency, Denver, Colorado (with J. G. Dickson, V. D. Adams, J. Manwaring, D. L. Sorensen, and D. B. Porcella) 1979.

Isolation and Identification of Organic Residue from Processed Oil Shale. Oil Shale Symposium Sponsored by Environmental Protection Agency, Denver, Colorado (with D. L. Maase, D. L. Sorensen, and D. B. Porcella) 1979.

Applicability of the Ames/Salmonella-Microsome Test for the Detection of Mutagen in Chemical Mixtures. 60th Annual Meeting, Pacific Division, American Association for the Advancement of Science, Moscow, Idaho (with J. G. Dickson, J. Manwaring, and D. B. Porcella) 1979.

Using Three Phase Aquatic Microcosms to Assess Fates and Impacts of Chemicals in Microbial Communities. American Society for Microbiology, Los Angeles, California (with D. B. Porcella and A. J. Medine) 1979.

Water Requirements and Pollutional Potential of Gas Production from Carbonaceous Shale. Fifteenth American Water Resources Conference, Las Vegas, Nevada (with J. A. Cissell, D. S. Filip, J. E. Fletcher, and D. B. George) 1979.

An Assessment of Saline Water as a Viable Transport Medium in Coal Slurry Pipelines. Fifteenth American Water Resources Conference, Las Vegas, Nevada (with D. B. George and A. J. Seierstad) 1979.

Predictive Testing, Safety Assessment of Chemicals in the Workplace. Rocky Mountain Center for Occupational and Environmental Health, Logan, Utah (with J. G. Dickson) 1980.

Influence of Periphyton Photosynthesis on Carbonate Equilibria of a Hard-Water Mountain Stream. 2nd Winter Meeting, American Society of Limnology and Oceanography, Inc., Los Angeles, California (with G. L. Rupp and D. B. Porcella) 1980.

DARWIN L. SORENSEN

Research Microbiologist Utah Water Research Laboratory Utah State University

Date and Place of Birth

January 29, 1947 Gunnison, Utah

Degrees

B.S.	Bacteriology, Utah State University, Logan, 1972
M.S.	Bacteriology-Water Quality, Utah State University,
	Logan 1975

Research Experience

1971	Undergraduate Research (National Science Foundation,
	Student Originated Studies), Utah State University,
	Logan
1972 - 1974	Graduate Research Assistant
1974-present	Research Microbiologist, Utah Water Research Laboratory, Logan

Research Projects

1971	Bear Lake Pollution Study, Bear Lake, Utah-Idaho
1972 - 1974	In Situ Nitrogen Fixation in Cold Desert Soil
	Algae Crusts in Northern Utah
1974 - 1975	Waste Load Allocation in the Bear, Sevier and Virgin
	River Basins of Utah
1974-present	Establishment of Microbial Populations in Sterile
	Mine Spoils and Overburden
1975 - 1976	Inventory Related to Water Quality Objectives, Bear
	River Basin
1977-present	Identification of Presumptive Carcinogenic Compounds
-	Related to Water Supplies by Oil Shale Development

Scientific and Professional Societies

American Society for Microbiology Western Society of Soil Science

Publications

Thesis - In situ nitrogen fixation in cold desert soil-algae crusts in Northern Utah

Publications in Preparation

Erosional Transfers of Nitrogen in Desert Ecosystems. In: Nitrogen Processes of Desert Ecosystems. N.E. West and J. J. Skujins, eds. Dowden, Hutchinson and Ross, Inc. Stroudsburg, Pa. (with J. E. Fletcher and D. B. Porcella)

The role of nitrogen fixation by lichens and free living microorganisms in the dynamics of desert nitrogen cycling. In: Nitrogen
Processes of Desert Ecosytems. N. E. West and J. J. Skujins, eds.
Dowden, Hutchinson and Ross, Inc., Stroudsburg, Pa. (with R. Rychert,
J. J. Skujins and D. B. Porcella)

Technical Reports

Bear Lake Pollution Study: Bacteriology. Final report to the National Science Foundation. (with Martin Petersen, Richard Fuller, project leader)

Nitrogen and Carbon Flux in a Soil-Vegetation Complex in the Desert Biome. Unpublished research memorandum, U.S.I.B.P. Desert Biome, Utah State University. (with D. B. Porcella et al.)

Waste Load Allocation for the (Bear, Sevier, Virgin) River Basin as of October, 1973. Three publications of four volumes each. Performed for the State of Utah, Utah Water Research Laboratory, Utah State University. (several contributors)

In Situ Nitrogen Fixation in Cold Desert Soil-Algae Crusts in Northern Utah. Unpublished research memorandum, USIBP Desert Biome, Utah State University. (with D. B. Porcella)

Establishment of Microbial Populations in Sterile Mine Spoils and Overburden. First Annual Report, October 1975. Utah Water Research Laboratory, Utah State University. (with M. A. Anderson, W. A. Kneib, and D. B. Porcella)

Inventory Related to Water Quality Objectives, Bear River Type IV Study, Idaho-Utah-Wyoming. Prepared for USDA,, Soil Conservation Service. Utah Water Research Laboratory, Utah State University. (with six other authors)

Suspended and Dissolved Solids Effects on Freshwater Biota: A Review. EPA-600/3-77-042. Environmental Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Corvallis, Oregon 97330. (with M. M. McCarthy, E. J. Middlebrooks, and D. B. Porcella)

Unpublished Papers Presented at Scientific Meetings

A Microbial Bioassay for Determining the Deficiency or Fertility of Mine Spoils. Presented Before the Western Society of Soil Science June 15, 1976 at the 57th Pacific Div. Ann. Meet., U. of Montana, Missoula.

Ammonia Toxicity from High Rates of Ammonia-Nitrate Addition to Mineral Mine Spoils: Laboratory Findings. Presented before the Western Society of Soil Science, June 14, 1977, at the 58th Pacific Div. Ann. Meet., AAAS, San Francisco State U., San Francisco.

EUGENE K. ISRAELSEN

Senior Research Engineer Utah Water Research Laboratory Utah State University

Dated: 4/80

Date and Place of Birth

June 28, 1936

Hyrum, Utah

Education

Utah State University, Logan, Utah, 1962 B.S. M.S. Utah State University, Logan, Utah, 1967

Administrative Experience

Participated in the administration of many research projects. Experience includes formulating project work plan, directing project personnel, and managing monetary expenditures during the project operation.

Research Experience

1959-61	Part-time U.S. Department of Agriculture, ARS, Logan, Utah. Watershed Model Study.
1961-62	Utah Water and Power Board, Salt Lake City, Utah. Assistant Engineer, Dam Construction.
1962-64	U.S. Army.
1964-65	Part-time Utah Water Research Laboratory, Logan, Utah. Flow Resistance Exerted by Schematic Dunes in an Open Channel.
1965-present	Utah Water Research Laboratory, Logan, Utah. Studies concerning hydrologic, water resource and water quality systems. Multidisciplinary approach to the solution of these problems. Significant involvement in hydrologic and water resource systems simulation.

Major Research Projects

Application of Electronic Analog Device to Solution of Hydrologic and River-Basin-Planning Problems

Sequential Water Use within a Hydrologic Complex

New Techniques of Hydrologic Analog Modeling

Application of Electronic Analog Device to Solution of Hydrologic and River-Basin-Planning Problems - Phase II

Electronic Analog Simulation of the Salinity Flow System within the Upper Colorado River Basin

Application of an Electronic Analog Computer to the Simulation of the Total Hydrologic-Economic Flow System

Reynolds Creek Watershed Modeling

Modeling the Snowmelt Process

The Development of a Simulation Model for the Bear River Basin

Computer Simulation of Urban Hydrologic Systems

Hybrid Computer Simulation as Applied to the Management of Water Salinity within a Hydrologic System

Evaluation of Flood Risk Factor in the Design of Storm Drainage Systems for Urban Areas

Regional Analysis of Runoff Characteristics for Small Urban Watersheds

Develop Hybrid Models for the Upper Jordan Drainage

Hybrid Computer Simulation of the Hydrologic Salinity Flow System within the Bear River Basin

Modeling the Total Hydrologic-Sociologic Flow System of Urban Areas

Computer Simulation of Forest Watersheds

Simulation Model of the San Juan River Basin

Hydrologic and Related Physical Processes in the Olympus Cove Area of Salt Lake County

A Technique for Prediction of Aquatic-Ecosystem Response to Weather Modification

Erosion Control During Highway Construction

Waste Load Allocation Study of the Bear, Sevier, and Virgin River Basins

Water-Land Use Management Model for the Sevier River

The Assessment of the Impacts of Public Law 92-500 in the Colorado River Basin

The In-Channel Processes which Contribute to the Salinity of the Price River, Utah

Inventory Related to Water Quality Objectives, Bear River Basin Type IV Study, Idaho-Utah-Wyoming

Quality Monitoring and Application of a Quality Model to the San Pitch River System

Simulation Study of the San Juan River Basin Hydrology and Flow System

Erosion Control Product Testing

Testing Fiber Mulches for Growth Media and Erosion Control

The Hydrologic and Water Quality Impacts of Conservation Measures in the Sevier River Basin

Salinity Precipitation in Reservoirs

Management of the Hydrologic System in Areas Subject to Coal Mining Activities

The Potential of Water and Salt Yield from Overland Flow on Natural Resource Lands in the Price River Basin

A Resource Survey of Hydroelectric Power Potential in Utah

Flood Hydrology Analysis for Twenty-four Dams in Utah

Publications

Technical Reports - Individual Authorship

Effect of the Free Surface on the Resistance to Flow Over Schematic Dunes in Open Channels. M.S. Thesis, Utah State University, Logan, Utah. June 1967.

Technical Reports - Joint Authorship

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An Approach to Determining the State of the Art of Controlling Erosion During Highway Construction. Presented at the 5th Conference of the International Erosion Control Assoc., Sacramento, California. February 1974.

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Degrees

B.S.	Biological	Science,	Colorado	State	University,	Fort
	Collins, C	olorado,	1969			

M.S. Microbial Ecology, Utah State University, Logan, Utah, 1975

Ph.D. Environmental Engineering, Utah State University, Logan, Utah, 1979

Research Experience

1971-1974	Graduate	Student	and	Research	Assistant,	Biology,	Utah
	State Un:	iversity	, Lo	gan, Utah			

1974-1975 Research Biologist-Chemist, Utah Water Research Laboratory, Utah State University, Logan, Utah

1975-1979 Graduate Student and Research Assistant, Civil and Environmental Engineering, Utah State University, Logan, Utah

1979-present Research Engineer, Utah Water Research Laboratory, Utah State University, Logan, Utah

Major Research Projects

1971-1973	Research Assistant,	Desert Biome:	The algae of cold
	desert soil crusts		

1973-1975 Research Biologist-Chemist, Utah Water Research Laboratory

1975-1979 Research Assistant, Utah Water Research Laboratory:
The biological role of specific compounds in aquatic ecosystems produced by oil shale development

1979-present Surface Impoundment Assessment for the State of Utah

Scientific and Professional Societies

American Society of Civil Engineers American Society of Limnology and Oceanography Phycological Society of America Utah Water Pollution Control Federation

Accomplishments and Honors

Alpha Lambda Delta, 1966
Tri-Beta, 1969
Sigma Xi, 1977
President, Association of Environmental Engineering Graduate
Students, 1977-1978
Student Representative, Utah Water Research Laboratory Research
Advisory Council, 1976-1977
Tau Beta Pi, 1979

Publications

Carbon, Nitrogen and Algal Biomass in Cold Desert Soil Crusts. (M.S. Thesis) Utah State University, Logan, Utah. 1975.

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THE INITIAL IMPOUNDMENT LISTS

MUNICIPAL IMPOUNDMENTS

SIA # Filed			MUNICIPAL	IMPOUNDMENTS
Mun 1			Form	
Mun 2 A 2 Beaver Mun 3 A 3 Beaver Mun 4 Bloomington Mun 6 1 5 Bonanza Mun 5 1 6 Castle Dale (Orangeville) Common 6 Castle Dale (Orangeville) Mun 7 A 9 Corperton Mun 7 A 9 Corjecton Mun 8 A 10 Delta Mun 9 A 11 Duchesne Mun 10 A 12 Dutch John Emery Mun 11 A 14 Ephraim Mun 11 A 14 Ephraim Mun 12 1 15 Ferron Mun 13 A 16 Fillmore Mun 14 1 17 Grantsville Mun 15 A <th< td=""><td>SIA</td><td><u>#</u></td><td><u>Filed</u></td><td></td></th<>	SIA	<u>#</u>	<u>Filed</u>	
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A = Assessed (Section 1 and 2 forms filed) 1 = Located (section 1 filed)

Italicezed entries are additions to the original lists

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Mun	33	A 44	,	Tropic
Mun	34	1 45		Washington
Mun	35	A 46	,	Wellsville
Mun	36	A 47	•	Wendover
		Stat	e Facilities	3
Mun	45	A 48	3	Willard Bay State Park
		49		Wendover Rest Stop
		50		Utah State Prison
		Fede	eral Faciliti	es
	•	1 000		
Mun	46	A 51		Bryce Canyon (National Park Service)
		52		Dugway Proving Ground
		53		Fort Duchesne
				Glen Canyon National Recreation Area
Mun	47	A 54	,	Bullfrog Basin
Mun	48	A 55		Hall's Crossing
		56		Hite Crossing
		57		Wahweep Marina
Mun	48	1 58		Natural Bridges National Monument
		59		Tooele Army Depot
		60	,	Utah Launch Comples
		61		Whiterocks
Mun	55	A		Dinosaur National Monument (National Park Service)
				National Forest Service
Mun	50	1		Ashley National Forest
		6		Buckboard
		6	3	Luscerne
		6	4	Cedar Springs
		6	5	Bootleg
		6	6	Dutch John
		6	7	Altona
				Dixie National Forest
Mun	37	A 68	}	Duck Creek
Mun	38	A 69		Panguitch Lake
		70	1	Four Mile Bench
				Fishlake National Forest
		71		Fishlake
				Uinta National Forest
Mun	39	A 72	•	Lodgepole
Mun	40	A 73	;	Blackhawk
				Wasatch National Forest
Mun	51	A 74	•	Bear River
Mun		A 75		Box Elder
Mun	53	A 76	•	Provo River

INDUSTRIAL IMPOUNDMENTS

	II.	Form				
SIA	#	<u>File</u>	<u>.ed</u>			
Ind	23	A 1	1	American Commodities	Hyrum	rendering
Ind			2	American Oil (Amoco Oil Co.)	North Salt Lake Salt Lake City	
		3	3	Atlas Minerals	Moab	uranium
			4	Blackhawk Resinin Chemicals		
			5	Brush Berylium	Delta	ore process
			6	Bunker and Sons Dairy	Delta	milk processing
Ind	18		7 8	Cache Valley Dairy Association Cache Valley Trout Farm	Smithfield Smithfield	milk processing
Ind	9	A		Caribou Four Corners	Woods Cross	oil refinery
Ind	7	A		Chevron Oil	North Salt Lake	
			. 1	Clinton Oil	Vernal	petro crude oil
			.2	Combined Metals Reduction Work	Bauer	coal byproducts
			.3	Cui International	Garland	animal byproducts
			4	Dixie Basin Smelters	Hurricane	copper milling
			.5	El Paso Natural Gas	Aneth	petro natural gas
т Л	22		.6	Energy Fuels	Alicado Mas	
Ind	22	A		Betty Mine	Abajo Mts.	uranium
		, -	.7	Glade Pit Equity Oil	Ashley area	uranium
			.8	Essex International	Milford	petro copper milling
Ind	1	A 20		Filtrol Corporation	Salt Lake City	milling catalyist
Ind	2	A 21		Fur Breeder's Agricultural Coop	_	animal byproducts
Ind	70	4		Commiss Danistic Comm	Co mucad	mink feed
Ind		A 22	2	Georgia Pacific Corp Gossner Cheese	Sigurd	
THO	21		.2 23	Great Salt Lake Minerals	Logan	
			.5 !5	Hollingsworth	Ashley area	
		26		Humble Oil and Refinery Co.	Roosevelt	petro crude oil
Ind	10	A 27		Husky Oil	North Salt Lake	-
Ind	-	A 28		Ideal Cement Company	Devil's Slide	cement
			0	Kennecott Copper Corporation		
				Arthur Concentrator	Arthur	copper milling
Ind	3	A		Magna Concentrator	Magna	copper milling
				Precipitation Plant	Copperton	copper milling
				Tintic Division	Eureka	lead, copper and
						zinc milling
		31	1	Keystone Wallace Resources	La Sal	copper milling
Ind	30	A 32		MariantDye Carbonic	Wellington	CO ₂ plant
			14	Micro Copper Corporation	Moab	copper milling
Ind		A 35		Miller, E. A., and Sons	Hyrum	slaughterhouse
Ind	19	A 36		Moroni Turkey Processing Plant	Moroni	slaughterhouse, turkey
		37	17	National Galvanizing	Centerville	misc. zinc galvanizing
Ind	<i>32</i>	1		NL Industries	Rowley	-
Ind	12	1		Park City Ventures	Park City	
Ind		A 38	8	Parnel1	Laketown	slaughterhouse
Ind	31	A		Pepperidge Farm, Inc.	Richmond	

SIA #	Forms Filed	•		
			** 1 #	
Ind 5			Woods Cross	oil refinery
T. 1 00	41		Duchesne	oil waste
Ind 33	A 42	Reilly Tar and Chemical	Provo	chemicals, coal tar
Ind 6	1 43	•	La Sal	uranium milling
	44	South Ogden Products Corp.	South Ogden	cannery
Ind 34	1 45		Ogden	petroleum recovery
	46	Springville Nat. Fish Hatchery	Springville	fish
Ind 14		Stauffer Chemical Company	Vernal	milling, mining
Ind 13			Magna	fertilizer
	47	Syro-Steel	Woods Cross	steel
Ind 36	1 48	Texas Gulf Incorporated	Moab	chemicals
Ind 29	A 49		Salt Lake	chemicals
Ind 4	A 50	Tri-Miller Packing	Hyrum	slaughterhouse
	51	Union Carbide	Salt Lake	chemicals
	52	U.S. Fuel	Hiawatha	coal washing
	53	U.S. Smelt Refinery and Mining	Midvale	smelter
Ind 28	A 54	U.S. Steel-Geneva	Provo	milling steel
	55	Utah and Idaho Sugar	Garland	sugar refining
	56	Utah Hide and Tallow	Spanish Fork	animal byproducts
	57	Utah Power and Light		
Ind 15	A	Carbon Plant	Castle Gate	
Ind 25	A	Gadsby Plant	Salt Lake	
		Hunter Plant	Emery County	
Ind 24	A	Huntington Plant	Huntington	
	58	Utah State Prison	Draper	milk processing slaughterhouse
	59	Valley Rendering Corporation	Hyrum	animal byproducts
Ind 16	A 60	Wasatch Chemical	Salt Lake	chemicals
	61	Weber County Incinerator	Ogden	misc. garbage
	62	Wellington Coal Cleaning Plant	Wellington	coal washing
Ind 17	\boldsymbol{A}	Western Dairymen Coop, Inc.	Richmond	
Ind 37	A 63	Western Refinery	Midvale	smelter
Ind 21	1 64	Western Zirconium		
	65	Williams Energy Company	Moab	petro LP gas
Ind 11	A 66	Pacific States Cast Iron Pipe	Provo	pipe
		Co.		

No Ind 35 used

AGRICULTURAL IMPOUNDMENTS

	Forms
SIA #	Filed

Beaver County

- Agr 6 A l Jim Craw: Minersville, impoundments for liquid wastes from animals
- Agr 5 A 2 Minersville Cow Palace Dairy: Minersville, impoundments for liquid wastes from animals

Box Elder County

- 3 LDS Church Locin Farm Stake: Willard, impoundments for liquid wastes from animals, hogs
- 4 J. Y. Ferry and Sons: Corinne, impoundments for liquid wastes from animals

Cache County

- Agr 7 A 5 William Harris: Richmond, impoundments for liquid wastes from animals, dairy
- Agr l A 6 Utah State University: Logan, impoundments for liquid wastes from animals, dairy

Millard County

7 C and L Dairy: Delta, impoundments for liquid wastes from animals

Salt Lake County

Agr 4 A 8 Fassio Egg Farm: Herriman, impoundments for liquid wastes from animals

Sanpete County

9 Gunnison Valley Dairy Coop.: Centerfield, impoundments for liquid wastes from animals

Sevier County

10 Hi-Roe Dairy: Monroe, impoundments for liquid wastes from animals

Tooele County

- 11 Pine Valley Ranch for Boys: Tooele, impoundments for liquid wastes from animals
- 12 Proud Porker; Grimm, E. W.; Globe Investment Co.: St. John, impoundments for liquid wastes from animals

Utah County

- 13 Brigham Young University: Salem, impoundments for liquid wastes from animals, dairy
- 14 LDS Church Sandy and North Sandy Stakes: impoundments for liquid wastes from animals, hogs

Washington County

15 Eldon Gentry: Washington Fields, impoundments for liquid wastes from animals

Weber County

Huntsville, impoundments for liquid wastes from animals

Agr 3 A Eugene Jensen: Centerfield

MINING

SIA #	Forms Filed					
		Anaconda Company (1	l)			
Min 1	1	Hecla Mining Co.	(2)	Hailstone	(Shut Down	Spring 1973)
Min 2	A	Kaiser Steel	(4)	Sunnyside		
Min 3	1	Valley Camp of Utah	n, Inc.	(2) Scofi	leld	
		Mayflower Mine		Keetley (F	leber)	
		Peabody Coal Compar	ny	Huntington	ı	

		OIL & GAS				SIA O&G	Forms
	Company	<u>Field</u>	<u>Gas</u>	<u>011</u>	<u>Total</u>	#	Filed
1.	Adams and Dizas	Greater Cisco Area	1-1	1-1	1-1		
2.	Alak Energy	undesignated	0-2	-	0-2		
3.	Altex Oil Corporation	Blaze Canyon	-	0-1	0-1		
4.	American Quasar Petroleum	Hogback Ridge Pineview Lodgepole	0-1 22-3	- 24-3 2-1	0-1 24-3 2-1	8 9	A A
5.	Anschutz Corporation	undesignated	1-1	1-0	1-1		
6.	Asamera Oil Company	Altamont Bluebell	5-0 1-0	5-0 1-0	5-0 1-0	30 116	A A
7.	Atlantic Richfield	East Canyon Overlook San Arroyo Boundary Butte	0-2 0-1 22-8	- 0-1 22-8 18-12	0-2 0-1 22-8 18-2	3 17	A A
8.	Aztec Oil and Gas	Gothic Mesa	***	9-1	9-1		
9.	B. Behling	Ferron	0-1	0-1	0-1		
10.	Belco Petroleum	San Arroyo Coyote Basin Natural Buttes White River Wonsits Valley undesignated	2-0 0-1 27-12 8-0 - 0-1	0-1 - 8-0 2-1 0-1	2-0 0-1 27-12 8-0 2-1 0-1		
11.	Ben Montin Gree	San Arroyo	1-0	_	1-0		
12.	Boardwalk Petroleum	Greater Cisco Area	2-0	1-0	2-0		
13.	Bow Valley Explorations	Altamont Bluebell Bluebell	3-0 8-1 5-1	7-0 15-4 7-0	7-0 15-4 7-1 }	49 93	A A
14.	Burton & Hawks	Sowers Canyon	0-1	0-1	0-1		
15.	B. W. Hancock	Stateline Bar X	1-2 4-0	- 1-1	1-2 4-1		
16.	C. C. Company	Greater Cisco Area	0-2	0-1	0-2		
17.	Champlin Petroleum	Pineview	3-1	3-1	3-1	10	A
18.	Chase Grossman	Danish Wash	0-1	-	0-1	2	Α
19.	Chorney Oil Company	undesignated	0-1	-	0-1	4	
20.	Chevron	Altamont Bluebell Bluebell Powder Springs Horseshoe Bend	7-0 49-0 5-0 0-1	8-0 49-0 5-0	8-0 49-0 5-0 0-1 0-3	50 126 12	A A A
		Red Wash Mesa White River	2-0 0-1	0-1	2-0 0-1	4.4	А

	Company	Field	Gas	0i1	Total	STA O&G #	Forms Filed
21.	Commanche Oil	Horseshoe Bend	3-3	***	3-3	13	A
22.	Consolidated	Salt Wash Akah Bluff Desert Creek Recapture Creek Tohanadla Southman Canyon	1-2 1-0 3-0 1-0 1-0 5-1 0-2	1-2 1-0 3-0 1-0 1-0 5-1	1-2 1-0 3-0 1-0 1-0 5-1 0-2		
23.	Continental Oil	Bluff Greater Aneth Ouray	2-5 43-20 1-1	2-5 43-20 -	2-5 43-20 1-1		
24.	Cordillera Corporation	Clear Creek	2-14	-	2-14	6	Α.
25.	Crest Oil Company	undesignated	0-1	_	0-1		
26.	CSV Exploration	Bar X	1-0	-	1-0		
27.	Diamond Shamrock	Altamont Bluebell Cedar Rim Castle Peak Monument Butte Nuttes Canyon Coyote Basin Horseshoe Bend Pariette Bench	3-2 2-0 4-0 1-0 4-1 0-1 - 3-3 6-0	3-2 2-0 4-0 1-0 7-1 0-1 6-1 2-2 6-0	3-2 2-0 4-0 1-0 7-1 0-1 6-1 3-3 6-0	51 95	A A
		Rockhouse Mesa Rockhouse Watch Buck Canyon	2-3 2-6 0-1		2-3 2-6 0-1		
28.	D. J. Stone	Oil Springs	1-0	-	1-0		
29.	Dow and Marks	Recapture Creek	1-0	1-0	1-0		
30.	D.P.J. Oil Company	Roosevelt	0-4	0-4	0-4		
31.	D. W. Cannon	River Junction	1-1	1-1	1-1		
32.	Energy Reserves	Ashley Valley Walker Hollow	3-0	6-4 3-0	6-4 3-0		
33.	Equity Oil	Farnham Dome Ashley Valley	1-1	<u>-</u> 5–5	1-1 5-5		
34.	Exxon Oil Company	Walker Hollow undesignated	36-2 1-0	37 - 2	37-2 1-0		
35.	Flying Diamond	Halfway Hollow Horseshoe Bend	0-1	1-1 0-1	1-1 0-1	15	A
36.	Fossil Petroleum	Ferron	-	0-1	0-1		
37.	Franciscan Oil	Monument Butte		0-1	0-1		
38.	Frazier	Greater Cisco Area	_	0-3	0-3		

ن سية

	Company	<u>Field</u>	Gas	<u>011</u>	<u>Total</u>		Forms Filed
39.	Friar Oil	Duchesne Gusher	2-2	2-1 0-1	2-2 0-1	18	A
40.	Gas Producing	Ouray	36-47	36-42	36-47		
41.	Getty Oil Company	East Canyon Horse Point	2-1 1-0	2-1	2-1 1-0	4	A
42.	Gillian and Fix	Greater Cisco Area	1-0	-	1-0		
43.	Gilman Hills	Ouray	1-1	-	1-1		
44.	Glen Ruby	Big Flat	0-2	0-2	0-2		
45.	Globe Mineral	Gusher	-	0-2	0-2		
46.	G. S. Campbell	Monument Butte	_	0-2	0-2		
47.	Gulf Oil Corporation	Altamont Bluebell Duchesne Bluebell undesignated Brennon Bottom Gypsum Hills Wonsits Valley Horseshoe Bend undesignated	17-3 28-0 1-0 6-0 - 3-0 - 0-1 0-1	20-3 28-0 1-0 - 5-0 3-0 3-0 0-16	20-3 28-0 1-0 6-0 5-0 3-0 0-16 0-1 0-1	52 120 19	A A A
48.	Hiko Bell	Bonanza Flatrock	0-1 0-1	0-1	0-1 0-1		
49.	Hollando/Travis	Ashley Valley	-	1-1	1-1		
50.	Holmes/Ventures	Turner Bluff	1-0	1-0	1-0		
51.	Husky Oil	Altamont	9-0	13-0	13-0	65	A
52.	Isabelle Thomas	Greater Cisco Area	0-2	-	0-2		
53.	K. Chattin	Starvation	2-0	2-0	2-0		
54.	Ken D. Luff	Walker Hollow	5-1	5-1	5-1		
55.	Kutch Industries	Cedar Rim	28-2	28-2	28-2		
56.	Ladd Petroleum Company	Recapture Creek	6-0	6-0	6-0		
57.	Mapco Incorporated	Altamont Island	15-6 3-2	13-6	15-6 3-2	45	A
58.	Merrion/Bayless	Bookcliffs Bluff Broken Hills Rockwell Flat Wilson Canyon Yellow Rock	1-1 2-0 1-0 1-0 1-0	1-1 2-0 - 1-0 1-0	1-1 2-0 1-0 1-0 1-0		
59.	Mesa Petroleum Company	Little Valley	1-0	1-0	1-0		

						SIA O&G	Forms
	Company	<u>Field</u>	Gas	<u>0il</u>	<u>Total</u>		<u>Filed</u>
60.	Mineral Soil	Gusher	0-1	0-1	0-1		
61.	M. M. Travis	Pleasant Valley	-	0-2	0-2		
62.	Monada Petroleum Corporation	Gusher		0-1	0-1		
63.	Monsanto	McElmo Mesa	4-0	4-0	4-0		
64.	Mountain Fuel Supply	Clay Basin Ferron Island Yellow Rock	8-7 6-1 1-0	8-7 - - 0-1	8-7 6-1 1-0 0-1		
65.	Northwest Explorations	Clay Basin	1-0	-	1-0		
66.	N. P. Energy	Greater Cisco Area	0-5	0-1	0-5		
67.	Oil Developers of Utah	Cedar Rim Starvation Indian Ridge	4-0 1-0 1-0	4-0 1-0 1-0	4-0 1-0 1-0	20	A
68.	Pacific Transportation Supply	undesignated undesignated	0-1 2-2	-	0-1 2-2		
69.	Phillips Petroleum	Greater Aneth Bridger Lake	88-18 4-3	88-18 4-3	88-18 4-3	11	A
70.	Polumbus Petroleum	Segundo Canyon Westwater	1-1 16-8	- 15-8	1-1 16-8		
71.	Reserve Oil and Gas	Peters Point	6-2	5-0	6-2	5	A
72.	Rex Monahan	Greater Cisco Area	2-0	-	2-0		
73.	R. Lacy	Ashley Valley	_	5-0	5-0		
74.	Robert S. West	undesignated	1-1	_	1-1		
75.	Rockwell Flat	Recapture Creek	-	1-0	1-0		
76.	R. Pumpelly	Agate	-	86-1	86-1		
77.	Sanchez O'Brien	Yellow Rock	1-0	1-0	1-0		
78.	S. H. Cort	Greater Cisco Area	0-1	-	0-1		
79.	Shell Oil Company	Altamont Bluebell Bluebell	61-4 15-1 3-0	75-4 15-0 4-0	75-4 15-1 4-0	73 97	A A
80.	SO Arkansas	Bull Canyon	0-1	10-1	10-1		
81.	Southern Natural Gas	Long Canyon	1-0	1-0	1-0		
82.	Stava Pumpelly	Gravel Pile	0-3	0-1	0-3		
83.	Strck. Rgr. Dymd	Monument Butte	0-1		0-1		

	Company	Field	Gas	Oil	Total	SIA O&G #	Forms Filed
Общрану		riciu	Gas		TOTAL		ritea
84.	Sun Oil Company	Powder Springs Red Wash	0-2 0-1		0-2 0-1		
85.	Superior Oil	Greater Aneth	180-16	180-16	180-16		
86.	Tennaco 0il Company	Upper Valley	***	25-0	25-0		
87.	Terra Resources	Bar X	7-0		7-0		
88.	Teton Energy Company	undesignated	1-0	0-1	1-1		
89.	Техасо	Nine Mile Canyon Fence Canyon Greater Aneth Ismay Flodine McElmo Mesa Bluebell Fence Canyon Seep Ridge Walker Hollow	1-0 1-0 200-17 25-5 0-1 3-0 3-0 4-4 1-0	1-0 - 200-17 25-5 1-1 3-0 - -	1-0 1-0 200-17 25-5 1-1 3-0 3-0 4-4 1-0	114	A
90.	Texas American Oil	Island	1-0	_	1-0		
91.	Titan Oil Company	undesignated	_	0-8	0-8		
92.	Trend Oil Company	Bryson Canyon	3-7		3-7		
93.	Union Oil Company	Monument Butte Big Indian Lisbon South Ismay	1-0 0-3 13-9 1-0	1-1 0-3 13-9 1-0	1-1 0-3 13-9 1-0	1	A
94.	Utex	Altamont Bluebell Bluebench	4-5 1-0 1-0	4-5 1-0 1-0	4-5 1-0 1-0	29 131	A A
95.	Vern Bolindes	Grassy Trails	_	1-1	1-1	7	A
96.	Vukasovich 0il	Greater Cisco Area	0-8	0-2	0-8		
97.	Walter Duncan	Greater Aneth	1-0	1-0	1-0		
98.	WA Moncrief	undesignated	4-0	5-0	5-0		
99.	WD Broadhead	Agate Gravel Pile	0-2 0-2	_	0-2 0-2		
100.	Wexpro Company	Patterson	0-1	0-1	0-1		
101.	W.H. Management	Walker Hollow	0-1	-	0-1		
102.	Willard Pease	Greater Cisco Area Pear Peak undesignated Cowboy Stateline Westwater	7-4 1-0 - - 1-0 0-2	0-3 - 2-0 4-0 -	7-4 1-0 2-0 4-0 1-0 0-2		

	Company	<u>Field</u>	Gas	011	<u>Total</u>	SIA O&G #	Forms Filed
103.	William Bush	Agate	1-0		1-0		
104.	WMS Ranches Incorporated	Mexican Hat	nionis	3-0	3-0		
105.	Wright Contact	Anido Creek	-	3-0	3-0		
106.	William G. Hellis	undesignated	0-1	_	0-1		

APPENDIX F

SILKA AND SWEARINGEN, 1978

A MANUAL FOR EVALUATING CONTAMINATION POTENTIAL OF SURFACE IMPOUNDMENTS

This manual was written

by

Lyle R. Silka and Ted L. Swearingen

Ground Water Protection Branch Office of Drinking Water U.S. Environmental Protection Agency

June 1978

DISCLAIMER

This manual has been reviewed by the Office of Drinking Water, U.S. Environmental Protection Agency, and approved for publication. Approval does not signify that the contents necessarily reflect the official ground-water protection policy of the U.S. Environmental Protection Agency.

PREFACE

The Manual for Evaluating Contamination Potential of Surface

Impoundments was prepared specifically for implementing a standardized evaluation system for the EPA Office of Drinking Water Surface

Impoundment Assessment (SIA) and serves as the training manual for that assessment. The SIA evaluation system set forth in the manual is based upon the previous work by Harry E. LeGrand who began over 15 years ago to develop a standardized, consistent approach to the selection of proper waste disposal sites. This system departs from the LeGrand system in order to accommodate certain philosophical differences concerning ground-water protection and specific technical aspects related to surface impoundments. In no way does this detract from the importance of the LeGrand system in serving as the basis for the SIA evaluation system.

This manual also was prepared with the assistance of the SIA work group who made many valuable suggestions. The work group members are:

Jack Keeley Ground Water Research Branch Kerr Environmental Research Laboratory/EPA Ada, Oklahoma

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Montana Department of Health and Environment

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Bureau of Water Resources Management
Florida Department of Environmental Regulation

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James Geraghty, David Miller and Nat Perlmutter Geraghty and Miller, Inc.

Bob Kent Texas Department of Water Resources

We also take this opportunity to thank the following for assisting Messrs. Silka and Swearingen in collecting case studies and field testing the evaluation system in the early phases of its development.

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California State Water Resources Control Board

Orville Stoddard Colorado State Health Department

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Paul Beam and Frank Andrews Florida Department of Environmental Regulation

Rauf Piskin Illinois Environmental Protection Agency

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Mark Coleman and Dick Jones Oklahoma State Department of Health

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Charles Ratte
Vermont Agency of Environmental Conservation

R.M. Sterrett, Eugene Siudyla and Virginia Newton Virginia Water Control Board

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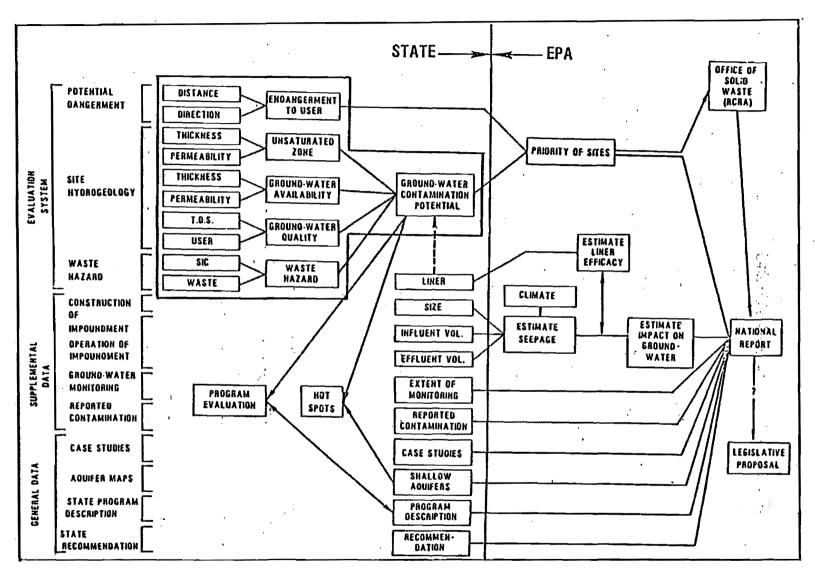
Appendix C - Glossary

Appendix D - Selected References

INTRODUCTION

An objective of the surface impoundment assessment (SIA) program (see Figure 1) is to rate the contamination potential of ground water from surface impoundments and to develop practices for the evaluation of different surface impoundments (elsewhere referred to as pits, ponds, and lagoons). One of the activities conducted under the SIA program is the application of the evaluation system described in the present manual. This evaluation system applies a numerical rating scheme to different impoundments that yields a first round approximation of the relative ground-water contamination potential of these impoundments.

The basis of this system was developed by Harry E. LeGrand in 1964. LeGrand and Henry S. Brown expanded and improved the system in 1977 under contract to the Office of Drinking Water. The present system described in this manual has been modified by the Office of Drinking Water through consultation with LeGrand and Brown to reflect its ground-water protection philosophy. Before the selection of the present evaluation system, other standardized systems were considered (Cherry, et.al., 1975; Pinder, et.al., 1977; Phillips, 1976) but were not deemed as suitable for the purposes of the assessment. The system is designed to provide an



2

Figure 1. Flow chart of the Surface Impoundment Assessment. The outlined portion is the evaluation system described in this manual.

approximation of the ground-water contamination potential of impoundments at a minimum cost. Precise, in-depth investigations of actual ground-water contamination from surface impoundments (i. e., drilling, etc.) would be too costly and time-consuming and are not involved in this first-round site evaluation. The specific site investigations into actual contamination would begin after this assessment is finished in order to optimize expenditures. Those sites identified as high contamination potential would be addressed first.

The philosophy guiding the development of this surface impoundment evaluation system is that underground drinking water sources must be protected for both present and future users as intended by Congress in the Safe Drinking Water Act, 1974. Ground-water pollution occurs when contaminants reach the water table (saturated zone) beneath the site. This is contrary to the commonly held view that ground-water contamination cannot legally be determined until the contaminated ground water crosses the property boundaries of the facilities. EPA believes that in order to protect the nation's ground-water resources it is necessary to identify potential contamination at the source where preventive measures may be initiated. The purpose of this evaluation system is to rank impoundments

in terms of their relative ground-water contamination potential. The evaluation system considers several hydrogeologic parameters in the rating of the site. There are numerous parameters that may be used in evaluating a site. However, many of these parameters are related and their simultaneous consideration would be redundant. Thus, only selected parameters representative of different processes, have been included. The present evaluation system provides a standardized methodology which will ensure more consistent national results.

The parameters used in the present SIA system have been separated into two distinct groups which correspond to the two phases of the evaluation, i.e., 1) the rating of the ground water contamination potential itself and 2) the rating of the relative magnitude of potential endangerment to current users of underground drinking water sources. The parameters considered unique in rating the ground-water contamination potential are 1) the thickness of the unsaturated zone and the type of earth material of that zone, 2) the relative hazard of the waste, and 3) the quantity and quality of the underground drinking water source beneath the site. The parameters considered unique in determining the rating for the potential for endangerment of currently used water resources include: 1) the type of water source, i.e. ground water or surface water, 2) whether that water source is in the anticipated flow direction of the contaminated ground water

(if such contamination occurred); and 3) the distance between the potential contamination source and the water source. These parameters account for the basic processes and factors which determine the contamination potential of the site and which indicated the relative threat to underground drinking water sources.

The level of contamination of ground water is subject to varying degrees of attenuation as the water flows through the unsaturated zone and on through the aquifer; however, the evaluation focuses on the potential for contamination of underground water sources.

Attenuation mechanisms are very complex, varying with the type of waste, earth material, and physico-chemical environment. A general site evaluation system concerned with an approximation of the contamination potential cannot consider the specific attenuative capabilities of different earth materials for different wastes, particularly since there exists a vast variety of complex wastes possible. This evaluation system therefore treats attenuation in an indirect manner by considering it in combination with permeability.

The evaluation is performed in a sequence (see Figure 2). The first four steps involve the evaluation of the potential for ground water to be contaminated by rating the site's hydrogeology and waste character. The fifth step then determines the site's overall contamination potential relative to other rated sites by combining the first four steps. It must be stressed that this overall rating will express only a site's hydrogeologic

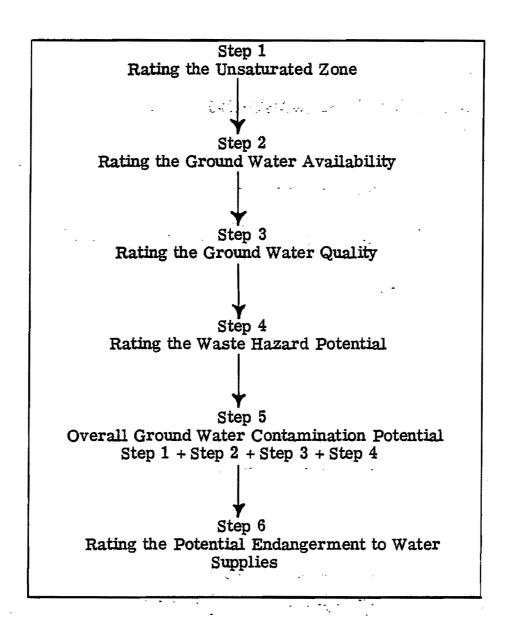


Figure 2. Generalized sequence of steps involved in the SIA evaluation system.

conditions relative to those conditions for all possible sites, and does not relate to a site's absolute degree of ground-water contamination. Such determination of actual contamination involving ground-water monitoring and sampling procedures must be made following site specific investigations. This system allows the investigator to assign priorities to sites on the basis of contamination potential so that the investigator could then concentrate resources upon the further investigation of these sites that rank highest in terms of their contamination potential.

Precise data is not necessary for the application of the SIA evaluation system. Performing precise measurements of the the depth to the water table, the character of the earth materials underlying the site, the hydrogeology at the site, etc., can be costly and time consuming. It must be remembered that this evaluation system is a first-round approximation and therefore estimates based on the best available information will be used with the expectation that they will provide satisfactory results for first-round evaluations.

STEP 1

GUIDANCE FOR RATING THE UNSATURATED ZONE

The earth material characteristics of the unsaturated zone underlying the surface impoundment are rated to determine the potential for contaminants to reach the water table. This step involves the combined rating of a) the thickness of the unsaturated zone, and b) earth material (both consolidated and unconsolidated rock) in the unsaturated zone (see Table I).

Step 1, Part A, Determination of the depth to the saturated zone for Step 1

Contaminants attenuate to varying degrees as they migrate down through the unsaturated zone, depending upon the thickness and the type of earth material. Therefore, more favorable conditions exist where the water table is deeper. The depth to the saturated zone is the depth from the base of the surface impoundment to the water table. This depth may be measured to the water table in unconfined aquifers (See Site 1 in Figure 3) or, in the case of a confined aquifer, to the top of the confined aquifer (See Site 2 in Figure 3). Where a perched water table is known to occur, the depth may be measured

TABL I

Step 1. Rating of the Unsaturated Zone.

		:		1			
Earth Categ	Material Jory	ı	. 11	111	ıv	v	VI
ATEGORY yook	solidated	Gravel, Medium to Coarse Sand	Fine to Very Fine Sand	Sand with <15% clay, Silt	Sand with >15% but ≤50% clay	Clay with < 50% sand	Clay
DETERMINING NOSUON Socy	olidated	Cavernous or Fractured Limestone, Evaporites, Basalt Lava Fault Zones	Fractured Igneous and Metamorphic (Except Lava) Sandstone (Poorly Cemented)	Sandstone (Moderately Cemented) Fractured Shale	Sandstone (Well Cemented)	Siltstone	Unfractured Shale, Igneous and Metamorphic Rocks
Repre	esentative eability 2 od/ft -		,	÷	·		
l gp	od/ft -	≯ 200 -2	2 - 200	0.2 - 2	< 0.2 -5	< 0.02 −6	< 0.002 −7
gin cm	/sec -	>10	10: -: 10	10 - 10	< 10	< 10	<10 ,
				RATING MATRIX			
(in	>30	9A	6В	4C	20 ,	0E	0F
the Zone (i	>10 ≤30	· 9B	7В	5C	3D	· 1E	og
of t	> 3 ≤10	9C	. 8в	6c	40	2E	ОН
ckness of	> 1 \$ 3	9D _,	9F	7C	5D	3E	1F
Thickne Unsatur	%ete st > 0 ₹1	9E	96	9н	91	91	9К

V

to it rather than the underlying regional water table (See Site 3 in Figure 3). The investigator will decide whether to measure the depth to the perched water table or ignore it and measure to the regional water table. This decision should be based on the extent and thickness of the perched water table and its usefulness as a drinking water source. If the perched water table is currently being utilized as a drinking water source, the depth should be measured to it.

Water tables fluctuate on a diurnal, seasonal and annual basis due to natural and artificial causes. For this assessment system the depth to the water table should be determined on the basis of the seasonal high water table elevation. As is shown in Table I, the depth determination does not have to be exact since the intervals are large. Illustrations of possible well hydrographs are shown in Figures 4 and 5. Figure 4a depicts a hydrograph of a well in Illinois which is only affected by seasonal climatic variation. The depth to water table would be taken as approximately five feet (1.6 meters). In Figure 4b the well hydrograph illustrates a water table which is affected by seasonal pumping variation. Pumping is greatest and, as a result, the water table is lowest during May through September, the hot season when consumption

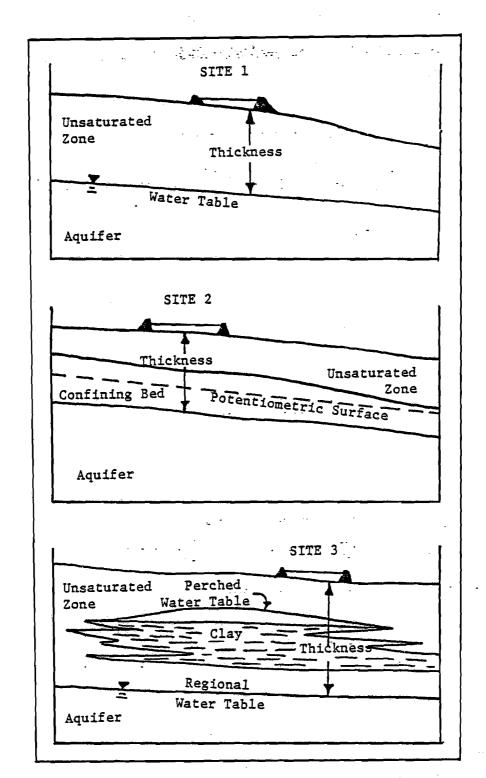


Figure 3. Guide for the determination of the depth to the saturated zone (water table in the unconfined case or top of confined aquifer) for completion of Step 1.

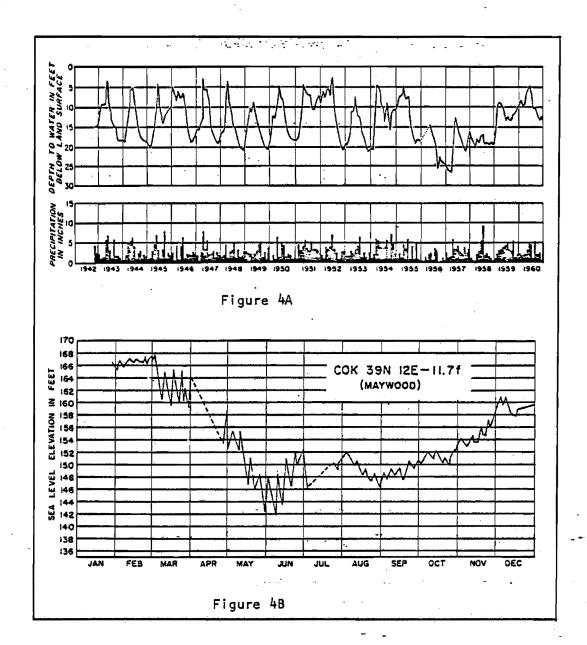


Figure 4. Well hydrographs of a water well at Maywood, Illinois, showing, in Figure 4A, seasonal fluctuations in a well remote from pumping well influences; and in Figure 4B, fluctuations in a well close to a ground water pumping area (from Walton, 1970, p. 106).

is greatest. During the winter months of November through March the demand decreases and the ground-water table recovers. In this case the depth to the water table would be computed at the highest level, at 168 feet (51.2 meters) of elevation rather than the summer levels of 142 feet (43.3 meters).

Figure 5 shows a long period of record for a well hydrograph located in Ainsworth, Nebraska, in which annual and longer term fluctuations exist. Although the maximum change in water level amounts to only about 6 or 7 feet (2 meters), other areas of the country do experience much greater variation and should be considered. However, in this example, the water level used in determining the depth to the water table should be the higher level of 34 feet (10.4 meters) below the surface. Note that in all these examples, the more conservative estimate is used for depth to the water table.

In the situation where a confined (artesian) aquifer is encountered below a disposal site and an unconfined (water table) aquifer does not exist, the depth is measured to the top of that confined aquifer.

Due to the nature of the confined aquifer, the net hydrostatic head of the system may decrease the possibility of contamination. However, conditions are not steady-state and other phenomena may affect the

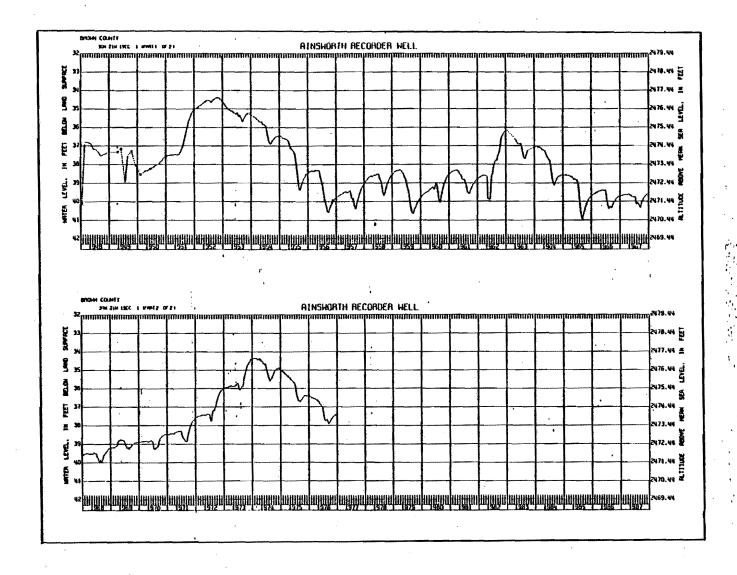


Figure 5. Well hydrograph of the Ainsworth, Nebraska, water supply well showing annual and longer term ground water level fluctuations (from Ellis and Pederson, 1977, p. 67).

net hydrostatic head of the confined aquifer. With the reductions of head which can be experienced (as in many irrigated areas of the country), confined aquifers may become vulnerable to contamination from surface sources through over pumping.

Step 1, Part B, Determination of the earth material category for Step 1

The type of earth material must be identified in order to complete Step 1. Table I contains an ordinal ranking of the general categories of earth materials based upon permeability, secondarily upon sorption character. The inclusion of sorption is based on the general relationships between grain size/surface area and permeability/sorption. Grain size (or pore size) is proportional to permeability and inversely proportional to surface area which is an important factor in sorption mechanisms. As grain size is inversely proportional to sorption capacity. sorption capacity is inversely proportional to permeability. Thus, going from left to right across the earth material categories in Table I, permeability decreases while sorption generally tends to increase. The categories take into account whether the permeability of the material is primary (properties existing at the time of formation such as the pore spaces) or secondary (properties of the material imposed upon it sometime after formation such as joints, fractures,

faults and solution channels). Secondary permeability is usually much greater than primary permeability due to the larger pathways. This distinction is very important in the categorization of earth materials as the presence of secondary permeability increases the flow of water and decreases attenuation. Fractures, joints, and faults are caused by earth movement and generally become closed and tighter with depth (generally within a hundred meters) because of increased pressures and decreased weathering effects. Faults often have an associated zone of crushed rock (fault breccia) which may be highly permeable.

The classification of the earth material should follow the guidelines of Table I and of Figures 6 and 7 which supply further assistance in the classification. Figure 6 gives a fairly comprehensive list of driller's terms found in driller's logs and the equivalent classification for Table I. Some groups of terms are assigned to more than one category, in which case the investigator must make a judgement. In Figure 7, the equivalent Unified Soil Classification System codes are shown.

	I	IV	or V
Gravel, Sand, Sand and C Specific yield	Fravel, and Similar Materials	Clay and Gravel, Sand Specific vi	y Clsy, and Similar Materieis aid 5 percent
Boulden	Gravel and sand		
Coarse gravel	Gravet and sendrock Medium sand	Cemented gravel (copbles) Cemented gravel and clay Cemented gravel, hard	Clay and silt
Copples		Comented groves, hard-	Clay, camented sand
Cannie stones	Running sand	Clay and gravel (rock)	Clay, compact loam and sand -Clay to coarse sand
Drygravet tif above water	Sand Sand, water	Clay and boulders (cobbies)	Clay, streaks of hard packed sand
Figs racks	and boulders	Clay, pack send, and grave	Clay to coarse sand Clay, streaks of sandy slay Clay, water
Free 1806	Send and cabbles	Congiomerate	CIAV WHITE LANGU DOCKER.
Gravel	Sand and time gravel Sand and gravel	Congiomerate Drygravel (balowsyster	Clay with small streaks of
Loose gravel	Sandy gravel	table) Gravel and clay	sand Clay with some sand
Rocks	Water gravel	Gravel (coment)	Clay with streets of fine sand
		Gravel and sandy clay	Clay with thin streaks of sand
		Gravel and tough shale Gravelly city	Porphyry clay Quicksandy clay
	` - -	Rocks in clay	Sand-clay
7~	TTT	Rotten cement Rotten concrete mixture	Sand shelf Shale and sand
11	or III	Sancarone and flowt rock	Solid play with strate of comented
		Silt and grave! Soli and boulders	Sticky sand and clay Tight muddy sand
Fine Send, Tight Send, Tight	Gravel, and Similar Materials	PON TÚC DOMIDELE	.Very fine tight muddy send
Specific yiel	d 10 percent	· Comented sand	· ·
Send and clay	Sandy losm	Cemented send and tiey Clay send	Ory sandy sift . Fine sandy loom
Sand and clay strate (work)	Sandy loam, send, and clay	Ory hard packed sand Dry sand (below	Fine sendy sitt
Sand and diff. Sand and hardpan	Sandy silt Sandy soll	Dry sand (below	Ground surface
Send and hard sand	Surface and fine send	water table) Dry send and dirt	Loam and clay
Sand and lave	Cloggy sand	Fine mucdy sand	Sandy tley loam
Sand and pack send Sand and sandy clay	Coarse pack sand Coarse pack sand Compacted sand and silt	Finesand, streaks of dev Fine tight muddy sand	Sediment Silt
Sand and coaperone	Compected sand and sift	Mard becked send, streaks	Sile and class
Sand and soil Sand and some clay	Dead send Dirty sand	of clay Hard sand and clay	Sitty clay loam
Sand, clay, and water	Eine nack sand	Hard set sand and clay	Sitty clay loam Sitty loam Soft loam
Sand crust	Fine guicksend with elkalismesk Fine sand	Muddy sand and clay	Sau
Sand-little water Sand, mud, and water	Fine sand, loose	Facked sand and clay Facked sand and shale	Soil and ctay Soil and mud
Sand (some water)	Hard pack send	Sand and clay mix	Soil and sendy shale
Sand streams, belenceday Sand, streams of clay	Hard sand Hard sand and streaks of	Send and tough shale	Surface formetion
Sand with comented	sendy cley	Send rock Sendstone	Top herdpen soil Topsoil
streaks	Hard sand rock and some water	Sendstone and lava	Toosoil and sandvalls
Sand with thin streeks of	sand	Set sand and play	Topsoil-sitt
	Hard send, soft streets	Set sand, streaks of clay Camented sandy clay	
Coerse, and sandy	Loamy fine sand Medium moddy sand	mard sandy clay (tight)	Decomposed hardown
Medium sandy Medium sandy Ciay	Milk sand	Sandy clay Sandy clay with small sand	Hardpan and sandstone Hardpan and sandy clay
Sandy	More or less send	streaks, very time	Hardpan and sandy shale
Sandy and sandy clay	Muccy sand Pack sand	Sangy shale	Maropan and sandy stratas
Sendy clay, sand, and	Poor water sand	Set sandy clay Silty clay	Hard rock (alluvial) Sandy hardpan
Sandy clay -water	Powder sand	Saft sandy clay	Semi-hardoon
bearing Sangy clay with streaks	Purnice send Quicksend	Clay and fine sand	Washboard
of sand	Send, mucky or diffy	Clay and purnice streaks	•
Sancy formation	Set sand Sitty sand	. Ash Catiche	Hard purnice Perphyry
Sandy muck Sandy sediment	Sloopy sand	Chelik	Serouse soft clay
Very sandy clay	Sticky sand	Hard lavs formation	Volcanic sen
Boulders, comented sand	Streekstineend.comments Surface and and clay		
Cement, pravel, send, and	Tight send		
rocks Clay and gravel, water			
bearing	Brittle clay and send	V o	r VI
Clay & rock, some loose rock	Clay and send Clay, sand, and wester	_	
Ciay, sand and gravel Ciay, sit, sand, and gravel	Clay with sand	## = = = = = = = = = = = = = = = =	mand the mariate
Consiomerate, gravel, and	Clay with sand streets	Cay and Het Smettin via	sted Materiels ald 3 percent
Conciomerate, nicky city,	More or less clay, trans sand sand sand sand		
sand and pravel	Mud and sand	Adobe Brittle clay	Lave Loose shale
Dirry gravet Fine gravet, hard	Mud, send, and water Sand and mud with chunks	Coving clay	Muck
Gravel and hardpan strata	of clay Silt and fine sand	Cement	Mud Packed clay
Grevel, comented sand	Silt and fine sand	Coment ledge Chappy day:	Loca craA
Gravel with streaks of clay Hard gravel	Silt and sand Soil, sand, and	City organizant took	Shale
Mard land and prevel	ciev -	Court Containing Long	Shell Slush
Packed cravel	Topical and light	Crumbly clay	Sourcesse
Packed sand and gravel Quickland and coobles	Weter sand sprinkled with	Decomposed granite	Scapstone fleet
Rock sand and clay	ciay	Dirt Good stay	Soft clay Squeeze clay
Sand and gravel, comorred	Flost rock (store)	Good clay	Sticky
Send and sitt, meny gravel	Laminated	Mark ciav	Sticky tlay
Sand, clay, streets of gravel	Pumice	Herdpen (H.P.) Herdpen shale	Tient clay
Sandy cley and gravel Set gravel	Seep water Soft sendstons	Hurd shale	Tule mud
Sitty sand and gravel	Strong seepage	Hard shell	Variable cley
(cobbies)		Joint City	Volcanic rock
Tight gravel		- -	
	•		
*	•		•
		V	I
		Crystallina R	edrock (fresh)
			visid 200
			
	•	Granisa	Marri rack
		Granite Hard boulders Hard granite	Herd rock Graphite and rocks Rock (if in area of known

Figure 6. Common driller's terms used in estimating specific yield (from Todd, 1970, p. $\bar{2}05$) and the equivalent evaluation system earth material categories.

Step 1 Earth Material Category Un (and Step 1 Designation) Sy	ified Soil assification stem Designation	Permeability Range (cm/sec)
Gravel (I) Medium to Coarse Sand (I) Fine to Very Fine Sand (II)	·	Permeable > 10 ⁻⁴ cm/sec
Sand with ≤1 5% Clay, Silt (III) Sand with > 15% but ≤ 50% Clay (IV)		Semi-permeable 10^{-2} to 10^{-6} cm/sec
Clay with < 50% Sand (V)	OL, MH CL, CH, OH	Relatively imperme- able < 10 ⁻⁶ cm/sec

Figure 7. Earth material categories and their approximate Unified Soil Classification System equivalents.

The geologic conditions beneath the site can be a very complex layering of clays, sands and gravels or consolidated sedimentary rocks such as sandstone, limestone and shale. In these layered situations the rating may be accomplished by considering the probable hydrology of the system. Where the different layers have similar hydrologic properties, the layers may be considered a single hydrologic unit for rating purposes. Where contrasting layers are encountered, best judgement must be exercised in rating the site. For example, if an impermeable shale overlies permeable sandstone rate only the thickness of shale. The investigator must be cautioned, however, that in rating a case where hydrologically unlike layers alternate, the waste is more likely to move through the more permeable zones and avoid the impermeable layers. As an example, a sand containing clay lenses should be rated as if only sand were present (See Figure 8). Similarly, where secondary permeability is present (i. e. fractures, joints and faults) the major path of waste movement is through the large conduits of secondary permeability rather than the interstices of primary permeability. This results in a short circuit of any attenuation capability present in the material. In such cases, the earth material would be rated as the more permeable categories.

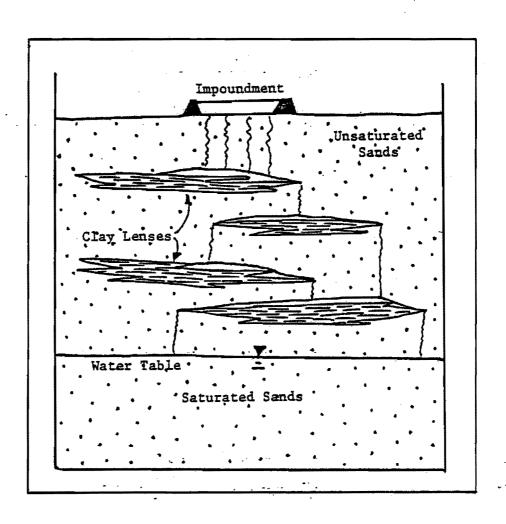


Figure 8. Hypothetical flow paths of waste-fluids seeping from a surface impoundment through unsaturated sands containing clay lenses.

Step 1, Part C, The Scoring of Step 1.

After the thickness of the unsaturated zone and the type of earth material in the unsaturated zone have been determined, refer to the Step 1 matrix (in Table 1) and record the appropriate score for the particular values of thickness and material.

Sources of information for completing Step 1.

Many data sources exist for the depth to the water table and the geologic material beneath a site. The site may have specific data available from State files if the site is permitted. The owner/operator may have data on shallow bedrock and soils available from borings or trenches made for the impoundment or nearby building foundations. Nearby water wells may provide data on the geology and ground-water levels, and adjacent road cuts can provide additional information on the subsurface.

General information is available from State agency reports such as the State geological survey, State departments of transportation soil borings, water resources agencies or universities with departments concerned with geology and ground-water resources.

The United States Geological Survey also publishes reports and

maintains files on ground water occurrence in each State. The U.S. Department of Agriculture, Soil Conservation Service, publishes county soils reports and maps with information on local soil profiles and bedrock, depth to the water table and depth to unweathered bedrock or parent material of the soil.

Example for determining the score for Step 1.

To score a site for Step 1, information is needed on: 1) the depth to the saturated zone and 2) the earth material of the unsaturated zone. The following example illustrates the method of scoring a site and will be utilized in all steps of the evaluation system.

A poultry processing plant, located in the Appalachian Valley and Ridge Province of a Mid-Atlantic State, operates a two acre waste treatment lagoon (about 8000 m) for disposal of poultry processing waste water. The waste treatment lagoon is shown in the site plan of Figure 9; Figure 10 gives the site location in relation to local topography.

Example Step 1, Part A. Determine the depth to the water table to establish the thickness of the unsaturated zone. In this example the

depth to the water table may be obtained from the driller's log of the plant water well. Figure 11 shows the driller's report which indicates that the depth to the static water table is 33 feet (about 10 meters). This static water table level is not the seasonal high water table at this site. The seasonal high water table would be expected to occur around 25 feet (7.5 meters).

The depth to the water table could also be estimated by studying the topographic map in Figure 10 if no well data was available. The elevation of the lagoon bottom is estimated to be about 1020 feet (311 meters) Mean Sea Level as the site is located between two 1020 foot contours. The river is about 100 feet (30 meters) to the west and, in the humid eastern climate, the water table can be assumed to be the river level at the river. Since the lagoon is close to the river, the water table is estimated to be about the same elevation as the river, i. e., 990 feet (302 meters). This is determined by noting that the 980 foot (299 meters) elevation crosses the river about 1 mile (1.6 kilometers) downstream and the 1000 foot (305 meters) elevation crosses about 1 mile upstream. Interpolation between 980 and 1000 gives a river elevation of 990 feet. By estimating the lagoon elevation (1020 feet) and adjacent

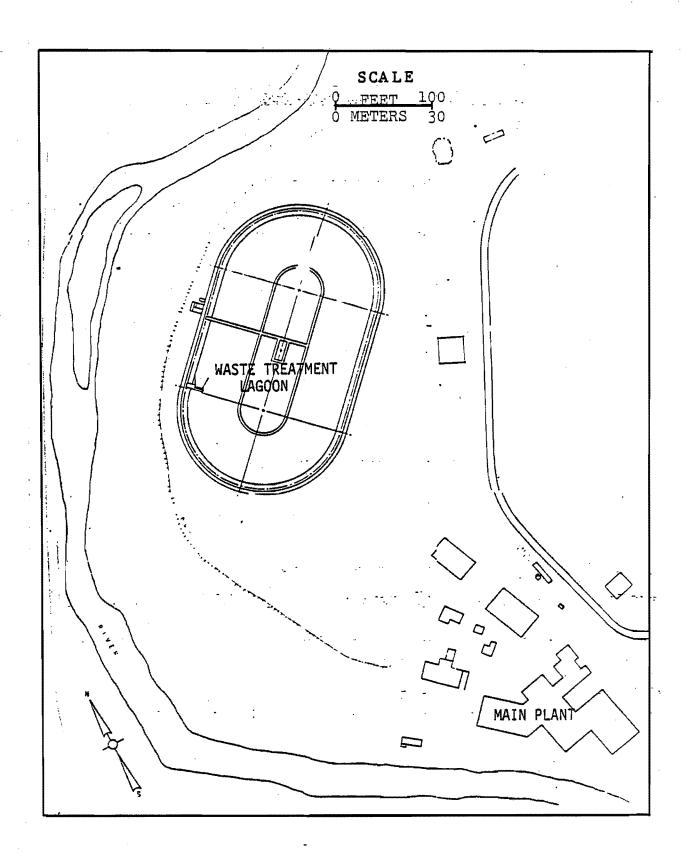


Figure 9. Poultry Processing Plant site plan.

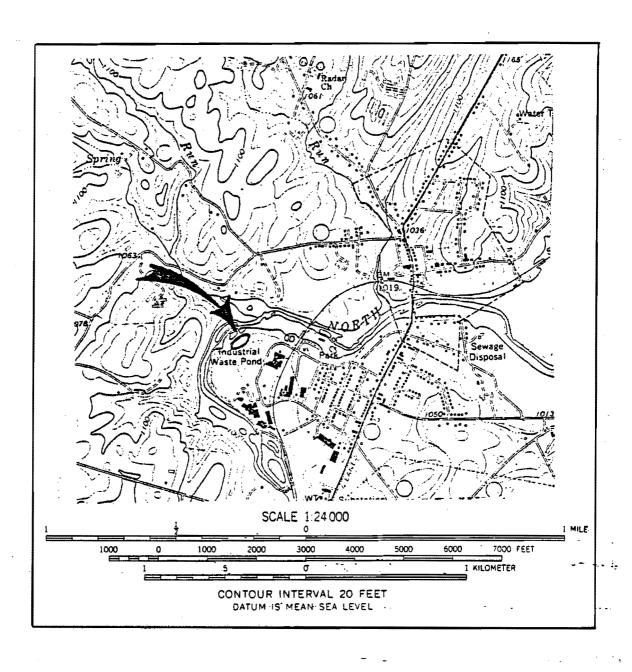


Figure 10. Portion of the 7.5 minute quadrangle topographic map of the Poultry Processing Plant (Marked by arrow).

136H 182-76 WATER CONDITIONS
DEPTH 22/
STATIC WATER LEVEL
WATER ZONES (fissures or formations supplying water)
(from) (to) (from). (to)
[
QUÁNTITY OF WATER
WELL PUMPED (or bailed) at
HOURS PUMPING.
FLOW (natural)G.P.M. HEADft. (above ground) \
REMARKS: Had 15 GPM above 300'
7.27
QUALITY OF WATER
COLOR Clear TASTE OK
■ 投稿所に関わり、企画を選集 きゅうしゅう 1 mm 1
ANALYSIS: AVAILABLE - Yes O He O: ATTACHED YES O HE O
TEMPERATURE
(son, brackish, iron, suifur, acid, other)
USE OF WATER: Commercia Town Chiadustry D Form D Publico
State
CONSTRUCTION
RIG TYPE (or method) / M. Kotava
(rotary, cable, bored, drivin, etc)
DATE: Started 2-60; Completed 8-8+60)
TOTAL DEPTHft.
BEDROCK offt.
GROUTING INFORMATION
METHOD USED. GTAVITY
GROUTING MATERIAL Benent + Water
DEPTH OF GROUTING 50
The state of the s
HOLE SIZE GASING SIZE
(diam) (from) (to) (diam) (from) (to)
10 0 11 50 1 1 1 1 50 1/1
6/15 56 424
SCREEN (or perforations)
(diam.) (from) (to) (agening size)

Figure 11. Portion of the driller's report on the water supply well drilled at the Poultry Processing Plant showing the static ground-water level.

river elevations (990 feet), the water table depth is estimated at 30 feet (about 9 meters). This estimate is fairly close to the measured static water level in the well. This method of estimating ground-water levels is useful only for perennial streams and is not reliable in the arid western United States where streams are intermittent. In such cases the ground-water level is often deeper than the stream bed and may have no relationship to the stream level or topography.

Example Step 1, Part B. The second part of completing Step 1 is to estimate the composition of the earth material of the unsaturated zone. For the Poultry Processing Plant, there is a substantial amount of data available from a county geologic report, the driller's report for the water well at the site and, several test borings conducted at the lagoon site. Figure 12 and 13 show the surface bedrock configuration and the structural cross-section of the area. The bedrock at the site is the Edinburg Formation composed of shale and limestone layers tilted at about 70 degrees to the west. The Driller's report containing the well log (Figure 14) indicates that about 16 feet (about 5 meters) of unconsolidated clay and gravel overlie a considerable thickness of variable limestone down to 424 feet (129 meters).

The logs of the test borings shown in Figures 15 indicate a quite variable thickness of sand and gravel (from 12 to 60 feet, or 3 to 18 meters) above limestone. It would be expected in this area of steeply tilted limestone and shale layers to have a rough, variable bedrock surface as a result of differential weathering.

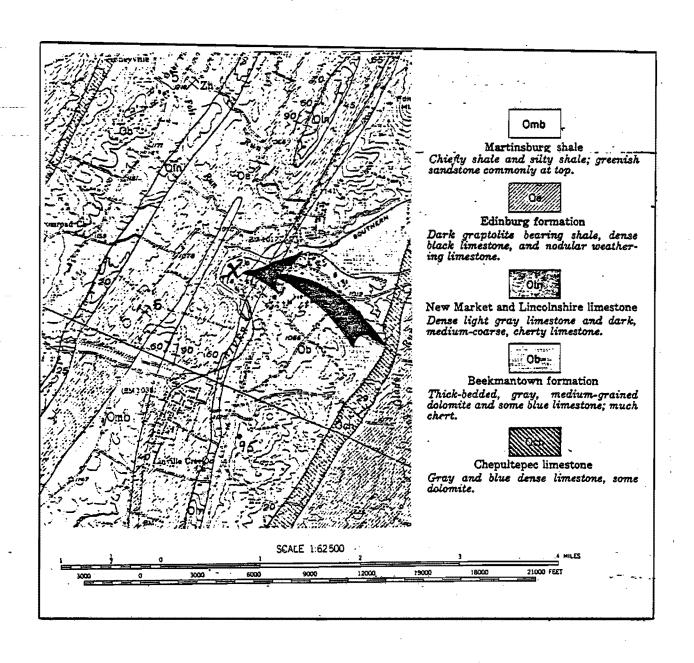
Example, Step 1, Part C. After determining the thickness of the unsaturated zone (7.5 meters) and the type of earth material in the unsaturated zone, the Step 1 score can be determined from the Step 1 matrix in Table I for the following parameters:

Thickness of the unsaturated zone = 7.5 meters

Material of the unsaturated zone = 3 meters of sand and gravel

4.5 meters of limestone

As the sand, gravel and limestone are of similar hydrologic character and in the same earth material category of Step 1, their thickness can be combined so that the Step 1 score would be determined for 7.5 meters of category 'T' material rated at 9C. (The presence of a liner would be noted by recording the appropriate code in the reporting form.)



Fugure 12. Portion of the geologic map from the County Geologic Report containing the location of the Poultry Processing Plant (marked by an X and an arrow).

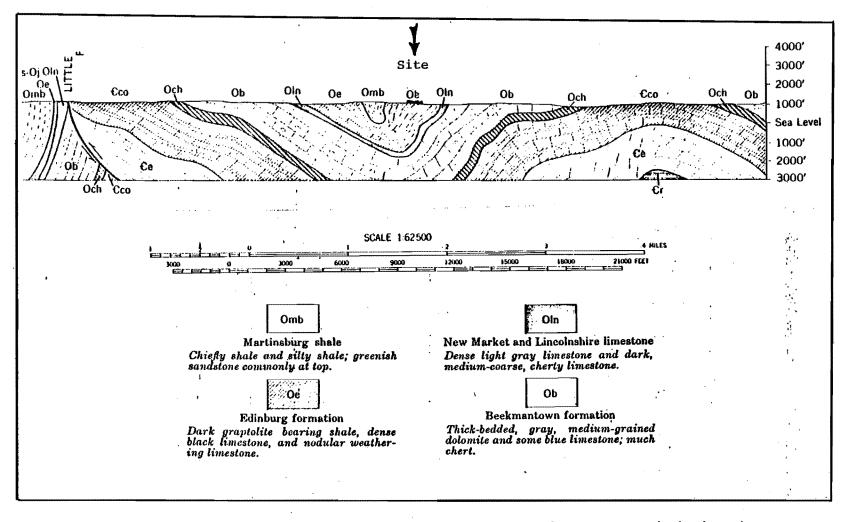


Figure 13. Portion of a geologic cross-section from the County Geologic Report depicting the general subsurface geologic structure around the Poultry Processing Plant (marked by the arrow).

(100M 10	TYPE OF LOIL OR ROCK PENFIRATED (grave), clay, etc., hardnocs, color, etc)	REMARK! (water, caving, shat, screen, sample, etc)
0 4	Top Soil	Well 182-76
4 5	Red clay	
5 /3	clay - gravel cemented	
13 16:00	Gray Limestone	
/6 23	Gray Limes Ione	
23 74		unton 3-4 Gpm
74 15	white Rock Blue Lime Son	·
75 108	Blue Lime with white Roca	
108 1/8	Blue Livie	\$
118 119	white Rock	de la la compa
119 280	Blue Line with white Rock	10-12 6 PM
280 398	Blue Lime Hard + Soft	
398 418	Soff Blue Lime	
418 424	Hard Blue Limestone	

Figure 14. Portion of the driller's report on the water supply well drilled at the Poultry Processing Plant showing the well log.

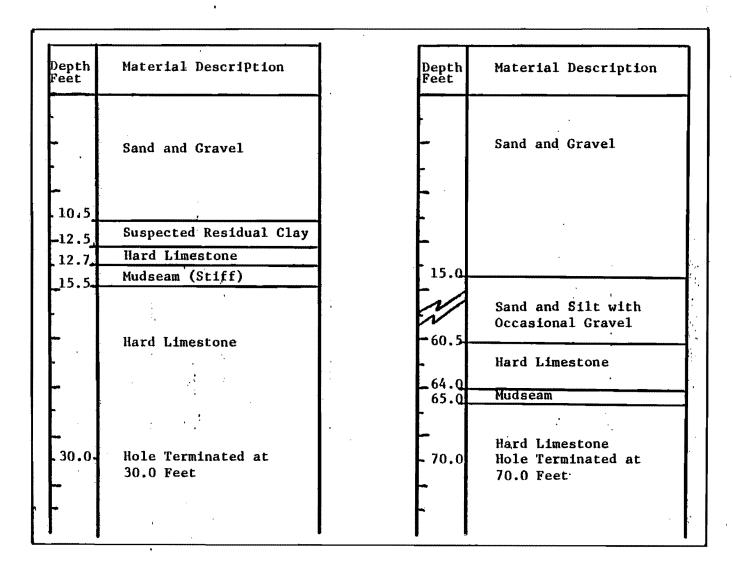


Figure 15. Driller's logs of test borings beneath the waste treatment lagoon at the Poultry Processing Plant.

STEP 2

GUIDANCE FOR RATING GROUND WATER

AVAILABILITY

Determining the ground-water availability ranking.

The ability of the aquifer to transmit ground water depends upon the permeability and saturated thickness of the aquifer. Step 2 provides the guidance to determine the ground-water availability rating of the aquifer. Since this evaluation system is a first-round approximation, the ground-water availability rating is not exact, but an approximation. The categories of earth material which make up the saturated zone are the same categories as used in Step 1 but have been combined into good, fair and poor aquifer material categories (Table II).

Estimate the aquifer's saturated thickness (in meters) and the type of earth material in the saturated zone as done for Step 1. Choose the appropriate ranking in the matrix of Step 2 (Table II) from the respective saturated thickness and earth material category. The letter accompanying the ranking is for the purpose of identifying what the ranking's derivation is if, at sometime in the future, there is reason to verify the number.

Sources of information for completing Step 2.

Sources of information in determining the parameters of Step 2 are similar to those of Step 1.

TABLE II

Step 2. Rating of the Ground Water Availability

			, , , , , , , , , , , , , , , , , , ,	
	Earth Material Category	1	11	111
	Unconsolidated Rock	Gravel or sand	Sand with ≤50% clay	Clay with <50% sand
	Consolidated Rock	Cavernous or Fractured Rock, Poorly Cemented Sandstone, Fault Zones	Moderately to Well Cemented Sandstone, Fractured Shale	Siltstone, Unfractured Shale and other Impervious Rock
FOR	Representative Permeability			
급	in gpd/ft	> 2	0.02 - 2	∠ 0.02 -6
GU IDEL INES	in cm/sec	>10	10 -10	< 10
		RATING	MATRIX	
	Thickness ≥ 30 of Saturated	6A	4c	2E
	Zone 3-30	5A	. 3C	1E
	(Meters) ≤ 3	3A	- 10 To	.OE **

Example, Step 2.

The type of earth material of the saturated zone can be determined from the county geologic map and cross-section (Figures 11 and 12) and the driller's log of Figure 13. Generally, the material down to greater than 400 feet (122 meters) below the surface is limestone with shale interbeds. From the drillers' report of the pump test (shown in Figure 10) the water supply well near the surface impoundment had 400 feet of drawdown at 15 gpm (57 liters per minute) after 2 hours pumping. From this data the limestone is very tight with little permeability and very little development of open fractures. The category in Step 2 for rating this material would be category II as the saturated zone is capable of producing water but only at moderate to low quantites. From the above sources of information the thickness of the saturated zone is estimated to be several hundred feet. The score for the ground-water availability ranking would be determined for earth material category II and greater than 30 meters thickness, i.e., the Step 2 ranking is "4C."

GUIDANCE FOR RATING THE GROUND-WATER QUALITY

Ground-water quality is a determinant of the ultimate usefulness of the ground water. Waste disposal sites situated in an area of poor quality ground water unsuitable as a drinking water supply would not present the same degree of pollution potential to ground water as the same site situated in an area having very good quality ground water. Step 3 (Table III) is used to determine the ranking of the aquifer's ground-water quality. The ranking is based upon the criteria that has been set forth in the proposed Underground Injection Control Regulations (40 CFR Part 146) of the Safe Drinking Water Act of 1974 (P. L. 93-523). The descriptions are to be used as basic guidelines to assist the investigator in arriving at the appropriate rating of ground-water quality. Consideration of only the background water quality of the aquifer is intended.

Determine the Aquifer Quality Ranking

Determine the total dissolved solids content of the ground water and apply it to the appropriate rating in Step 3, Table III. If the ground water is presently a drinking water supply, the ranking would be a "5" regardless of its total dissolved solids content.

Table III Ajain rajain wa wa

Step 3. Rating the Ground-Water Quality

Rating	Quality
5	≤ 500 mg/1 TDS or a current drinking water source
4	> 500 - ≤1000 mg/1 TDS
3	>1000 - ≤3000 mg/1 TDS
2	>3000 - ≤10,000 mg/1 TDS
1 .	>10,000 mg/1 TDS
0	No ground water present

Sources of information for completing Step 3.

Ground-water quality data for the determination of the Step 3 rating may be obtained from several sources. If the aquifer is presently used by individuals or communities, no further documentation is required. If industries or agriculture use the ground water, but not currently for human consumption, further quality data may be required for the rating. Many State agencies (i. e., geological surveys, health departments, water boards or commissions and State engineers) and the U.S. Geological Survey have considerable water quality data on file, in published reports and as maps outlining the ground-water quality in the States by aquifer.

Example, Step 3.

The quality of the ground water beneath the Poultry Processing Plant site would be rated "5" since the aquifer does supply drinking water, and in addition based upon driller's report, general State files and published reports, the aquifer has an overall good quality with very low total dissolved solids.

GUIDANCE FOR RATING THE WASTE HAZARD POTENTIAL

Contaminants that may enter ground water have been evaluated by their potential for causing harm to human health (Hazard Potential). The hazard potential rankings for contaminants range from 1 to 9 with 1 being least hazardous and 9 being most hazardous.

Contaminants and their hazard potential rankings are classified in two ways: (1) by contaminant source (Table IV), and (2) by contaminant type (Table V). Standard Industrial Classification (SIC) numbers are used to classify sources. Common sources and types of contaminants and their hazard potential ranges are illustrated in Figure 16.

There are many variables that influence a substance as it enters the ground-water environment such that its true hazard potential as a ground-water contaminant is not likely to be the same as its apparent hazard potential. Most such variables tend to reduce hazard potentials. The hazard potential rankings considered the following factors and their interactions.

TOXICITY - The ability of a substance to produce harm in or on the body of living organisms is extremely important in ranking the hazard potential of that substance. While some substances are highly toxic they may possess low mobility and thus be assigned a lower hazard potential ranking than a less toxic but highly mobile substance.

TABLE IV CONTAMINANT HAZARD POTENTIAL RANKINGS OF WASTE, CLASSIFIED BY SOURCE FOR STEP 4.

SIC Numbe	· -	Description of Waste Source	Hazard Potential Initial Rating
		Description of maste boules	THIEFT TOTAL
01		AGRICULTURAL PRODUCTION - CROPS	1-2
02		AGRICULTURAL PRODUCTION - LIVESTOCK	
	021	Livestock, except Dairy, Poultry and	3
		Animal Specialties	(5 for Feedlots)
	024	Dairy Farms	4
	025	Poultry and Eggs	4
	027	Animal Specialties	2-4
	029	General Farms, Primarily Livestock	2
10		METAL MINING	
	101	Iron Ores	4 .
	102	Copper Ores	6
	103	Lead and Zinc Ores	5
	104	Gold and Silver Ores	6
	105		5
	106	Ferroalloy Ores Except Vanadium	5
	108	Metal Mining Services	4
	1092	Mercury Ore	6
	1094	·	7
	1099	Metal Ores not elsewhere classified	5
11		ANTHRACITE MINING	7
12		BITUMINOUS COAL AND LIGNITE MINING	7
13		OIL AND GAS EXTRACTION	
	131	Crude Petroleum and Natural Gas	7
	132	Natural Gas Liquids	7
	1381	Drilling Oil and Gas Wells	6
	1382	Oil and Gas Field Exploration Services	T
	1389	Oil and Gas Field Services not elsewhere classified	Variable depending or Activity
14		MINING AND QUARRYING OF NON-METALLIC MINERALS,	
		EXCEPT FUELS	·
-	141	Dimension Store	2
	142	Crushed and Broken Stone, Including Riprap	2 2
	144	Sand and Gravel	
	145	Clay, Ceramic, and Refractory Minerals	2-5
	147	Chemical and Fertilizer Mineral Mining	4-7
	148	Nonmetallic Minerals Services	1-7
	149	Miscellaneous Non-metallic Minerals,	0.5
		except Fuels	2 - 5

(TABLE IV continued)

SIC Number	Description of Waste Source	Hazard Potential Initial Rating
16 162	CONSTRUCTION OTHER THAN BUILDING CONSTRUCTION Heavy Construction, not elsewhere classified (Dredging, especially in salt water)	4 -
20 201 202 203 204 205 206 207 208 209	Dairy Products Canned and Preserved Fruits and Vegetables Grain Mill Products Bakery Products Sugar and Confectionery Products Fats and Oils Beverages	3 2 4 2 2 2 2 3 2-5 2
22 223 226 229	TEXTILE MILL PRODUCTS, ALL EXCEPT LISTINGS BELOW Broad Woven Fabric Mills, Wool (including dyeing and finishing) Dying and Finishing Textiles, except Wool Fabrics and Knit Goods	6 6 6
24 241 242 243 243 243 249 249	Sawmills and Planing Mills Hardwood Veneer and Plywood Softwood Veneer and Plywood Structural Wood Members, not elsewhere classified (laminated wood-glue) Wood Preserving Particle Board	2 2 4 4 3 5 4 2-5
26 261 262 263	•	6 6 6

(TABLE 1V continued)

SIC		Description of House Column		Potential Rating
Number	*	Description of Waste Source	THILLIAL	
20		1		
28		CHEMICALS AND ALLIED PRODUCTS		
	2812	Alkalies and Chlorine	7-9	
	2813	Industrial Gases		
	2816	Inorganic Pigments	3-8	
	2819	Industrial Inorganic Chemicals,		
		not elsewhere classified	3-9	
	2821	Plastic Materials, Synthetic Resins, and		
		Nonvulcanizable Elastomers	6 - 8	
	2822	Synthetic Rubber (Vulcanizable Elastomers)	6 - 8	
	2823	Cellulose Man-Made Fibers	6-8	
	2824	Synthetic Organic Fibers, except Cellulosic	6-8	
	2831	Biological Products	6-9	
	2833	Medicinal Chemicals and Botanical Products	3-8	
	2834	Pharmaceutical Preparations	6-9	
	2841	Soap and Other Detergents, except		
*		specialty cleaners	4-6	
	2842	Specialty Cleaning, Polishing and		
		Sanitation Preparation	3-8	
	2843	Surface Active Agents, Finishing Agents,		
		Sulfonated Oils and Assistants	6-8	
	2844	Perfumes, Cosmetics, and other Toilet		
		Preparations	3-6	
	2851	Paints, Varnisher, Lacquers, Enamels, and		
		Allied Products	5-8	•
	2861	Gum and Wood Chemicals	5÷8	u = -,. ,.
	2865	Cyclic (coal tar) Crudes, and Cyclic		•
		Intermediates, Dyes and Organic Pigments		
		(Lakes and Toners)	6-9	,
	2869	Industrial Organic Chemicals, not elsewhere	U = J	
	2007	listed	3-9	

(TABLE IV continued)

,			-
SIC			Hazard Potential
Number		Description of Waste Source	Initial Rating
Number		Description of waste bource	THICKET MECHING
		· · · · · · · · · · · · · · · · · · ·	
•	2873	Nitrogenous Fertilizers	7-8
	2874	Phosphatic Fertilizers	7-8
	2875	Fertilizer Mixing Only	5
	2879	Pesticides and Agricultural Chemicals,	_
	20/3	Not Elsewhere Listed	5~9
	2891	· · · · · · · · · · · · · · · · · · ·	5-8
	2892	Explosives	6-9
	2893	Printing Ink	2-5
	2895		1-3
•			1-3
	2899	Chemicals and Chemical Preparations, not	
		Elsewhere Listed	3-9
29		PETROLEUM REFINING AND RELATED INDUSTRIES	
	291	Petroleum Refining	8
	295	Paving and Roofing Materials	7
			7
	299	Misc. Products of Petroleum and Coal	/
. 20		NUMBER AND ACCOUNTABLE DIAGRAGE BRODUCES	
30		RUBBER AND MISCELLANEOUS PLASTICS PRODUCTS	
	301	Tires and Inner Tubes	6
	302	Rubber and Plastic Footwear	6
	303	Reclaimed Rubber	6
	304		4
	-	· · · · · · · · · · · · · · · · · · ·	4
	306	Fabricated Rubber Products, not Elsewhere	
		Classified	4
		•	
31		LEATHER AND LEATHER PRODUCTS	•
•	311	Leather Tanning and Finishing	8 .
		(Remaining Three-Digit Codes)	1-3
		(Monativing Inter Pigit Godes)	
•	•		
3 2		STONE, CLAY, GLASS, AND CONCRETE PRODUCTS	
	321	Flat Glass	
	322	Glass and Glassware, Pressed or Blown	4
		· · · · · · · · · · · · · · · · · · ·	-
	324	Cement, Hydraulic	3
	3274	Lime	3 3 3
	3291	Abrasive Products	3
	3292	Asbestos	3
	3293	Gaskets, Packing, and Sealing Devices	3
	22,73	outhous, lacaling, and realing revices	√
33		PRIMARY METAL INDUSTRIES (EXCEPT AS NOTED BELOW)	3
	3312	Blast Furnaces, Steel Works, and	-
	2214		
		Rolling and Finishing Mills	6
	333	Primary Smelting and Refining of	
		Nonferrous Metals	7
	•	• • • • • • • • • • • • • • • • • • •	

(TABLE IV continued)

SIC Number			azard Potentia nitial Rating
34		FABRICATED METAL PRODUCTS, EXCEPT MACHINERY	,
		AND TRANSPORTATION EQUIPMENT (EXCEPT AS NOTED BELOW)	5
٠	347	Coating, Engraving, and Allied Services	8
	3482	Small Arms Ammunition	7
	3483	Ammunition, Except for Small Arms	
		not Elsewhere Classified	7
	3489	Ordnance and Accessories, not Elsewhere	
		Classified	7
	349	Misc. Fabricated Metal Products	3-6
35		MACHINERY, EXCEPT ELECTRICAL	5 - 7
36		ELECTRICAL AND ELECTRONIC MACHINERY, EQUIPMENT	
		AND SUPPLIES (EXCEPT AS NOTED BELOW)	5 - 7
	3691	Storage Batteries	8
	36 92	Primary Batteries, Dry and Wet	8
37		TRANSPORTATION EQUIPMENT	5-8
38		MEASURING, ANALYZING, AND CONTROLLING INSTRUMENTS PHOTOGRAPHIC, MEDICAL, AND OPTICAL GOODS; WATCHE	
		AND CLOCKS (EXCEPT AS NOTED BELOW)	
	386	Photographic Equipment and Supplies	7
39		MISCELLANEOUS MANUFACTURING INDUSTRIES	3-7
49		ELECTRIC, GAS, AND SANITARY SERVICES	** ** ·*
	491	Electric Services	3-5
	49 2	Gas Production and Distribution	3
	494	Water Supply	2
	4952	Sewerage Systems	2-5
	4953		2-9
	496	Steam Supply	2-4
	470	aream achtra	4 ⁻ 7

TABLE V

CONTAMINANT HAZARD POTENTIAL RANKINGS OF WASTES, CLASSIFIED BY TYPE FOR STEP 4

	Description	Hazard Potential Initial Rating	ID Number *
A.	SOLIDS	1-42	1100
	Ferrous Metals	1-7 ²	1100 1200
	Non-Ferrous Metals	•	
	Resins, Plastics and Rubbers	2	1300
	Wood and Paper Materials (except as noted belo	ow) 2 4	1 40 0 1 40 1
	- Bark		
	Textiles and Related Fibers Inert Materials (except as noted below)	2 2	1500 1600
		6	1601
	- Sulfide Mineral-Bearing Mine Tailings	. 5	1602
	- Slag and other Combustion Residues		1602
	- Rubble, Construction & Demolition Mixed	a 3	1603
	Waste		1700
	Animal Processing Wastes (Except as noted below	6	1700
	- Processed Skins, Hides and Leathers	4	1701
	- Dairy Wastes		-
	- Live Animal Wastes-Raw Manures (Feedlor	2-4	1703
	- Composts of Animal Waste	-	1704 1705
	- Dead Animals	5	1705 1800
	Edible Fruit and Vegetable Remains -	2-3	1000
	Putrescables		
В.	LIQUIDS		
	Organic Chemicals (Must be chemically Classif	ied) ²	2000
	- Aliphatic (Fatty) Acids	3-5	2001
	- Aromatic (Benzene) Acids	7-8	2002
	- Resin Acids		2003
	- Alcohols	5-7	2004
	- Aliphatic Hydrocarbons (Petroleum	•	•
•	Derivatives	4-6	2005
	- Aromatic Hydrocarbons (Benzene Derivat	i ves)6-8	2006
	- Sulfonated Hydrocarbons	7 - 8	2007
	- Halogenated Hydrocarbons	7 - 9	2008
	- Alkaloids	7-9	2009
	- Aliphatic Amines and Their Salts	1-4	2010
	- Anilines	6-8	2011
	- Pyridines	2-6	2012
	- Phenols	7-9	2013
	- Aldehydes	6-8	2014
	- Ketones	6-8	2015
	- Organic Sulfur Compounds (Sulfides,	7.0	2016
	Mercaptans) - Organometallic Compounds	7-9 7-9	2016 2017
	- Cyanides	7-9 ···	2017
	- Thiocyanides	2 - 6	2019
	- Sterols	<u>4</u> -0	2020
		1-4	2020
	- Sugars and Cellulose		
	- Esters	6-8	2022

Description	Hazard Potential Initial Rating	ID <u>Number</u> *
Inorganic Chemicals (Must be Chemically Class	ified) ²	2100
- Mineral and Metal Acids	5-8	2101
- Mineral and Metal Bases	5-8	2102
- Metal Salts, Including Heavy Metals	6-9	2103
- Oxides	5-8	2104
- Sulfides	5-8	2105
- Carbon or Graphite	1-3	2106
Other Chemical Process Wastes Not Previously	-	2.00
(Must be Chemically Classified) ²	5.00	2200
- !nks	2-5	2201
- Dyes	. 3-8	2202
- Paints	5-8	2203
- Adhesives	5-8	2204
- Pharmaceutical Wastes	6-9	2205
- Petrochemical Wastes	7-9	2206
- Metal Treatment Wastes	7-9	2207
- Solvents	6-9	2208
- Agricultural Chemicals (Pesticides,		2233
Herbicides, Fungicides, etc.)	7-9	2209
- Waxes and Tars	4-7	2210
- Fermentation and Culture Wastes	2-5	2211
- Oils, including Gasoline, Fuel Oil, et		2212
- Soaps and Detergents	4-6	2213
- Other Organic or Inorganic Chemicals,	. •	22.5
includes Radioactive Wastes	2-9	2214
Conventional Treatment Process Municipal Silud	-	2300
- From Biological Sewage Treatment	4-8	2301
- From Water Treatment and Conditioning	. •	-50.
Plants (Must be Chemically Classified	$)^2$ 2-5	2302
•		

^{*} ID Number is for identification of waste type in the Reporting Form.

Classification based on material in Environmental Protection Agency Publication, 670-2-75-024, pages 79-85, Prepared by Arthur D. Little, Inc. and published in 1975.

 $^{^2}$ For individual material ranking refer to solubility-toxicity tables prepared by Versar, Inc. for the Environmental Protection Agency.

MOBILITY - The material must be able to enter the ground-water environment and travel with the ground water. Certain substances are essentially immobile (eg., asbestos fibers) while others are highly mobile with most substances falling between these extremes.

PERSISTENCE - Some substances such as halogenated hydrocarbons decay or degrade very slowly and receive a higher hazard potential ranking than other equally toxic materials that decay more rapidly.

VOLUME - Some substances, such as tailings or slimes from mining operations, are only moderately toxic but because they are produced in enormous quantities are given a somewhat higher hazard potential ranking.

CONCENTRATION - Substances entering the ground-water environment in concentrations which could potentially endanger human health are ranked. Concentration may decrease with dilution and attenuation but the amount of decrease at a given place depends, in part, on waste mobility, waste interaction with soils and aquifer material, etc.

Determining the Waste Hazard Potential for Step 4.

Wastes may be simple in composition, but most are complex and the hazard potential rankings given in Tables IV and V are maximum values based on the most hazardous substance present in the contaminant. Such rankings are, of necessity, generalizations because of the unknown interactions that occur between substances and the variables of the ground-water environment.

For those substances or sources that show a hazard potential ranking range (e.g., 5-8) additional information concerning the specific nature of the source or contaminant is required for assigning a specific ranking. Specific rankings in such cases must be personal judgements by the assessor. Additional information for determining a specific ranking may be available from the source of the contaminant. i.e.. the industry may be able to supply specific information about the contaminant. In the event specific information is not available from the source, additional information may be obtained from an examination of descriptions of average contaminant characteristics listed in several publications cited below. For cases when there is considerable pretreatment of the waste, the ranking may be lowered to the bottom of its range. If no additional information is available, the first round approximation ranking must assume the worst case and a low confidence rating be given the ranking.

If sufficient information exists about the material (i.e., exact composition, concentration, volume, treatment prior to coming in contact with the ground, etc.) the rating may be lowered. In considering whether to lower the rating, some compounds degrade aerobically or anaerobically and the products of degradation are more hazardous than the parent chemical. Initial rankings may be modified downward provided:

- 1. The hazardous material in question has been effectively treated to lowerits hazard potential as a ground-water pollutant. Several references describe best available methods for treating contaminants to reduce their toxicity, for example see:
 - Sax, 1965, Dangerous Properties of Industrial Materials.
 - Identification of Potential contaminants of underground water sources from land spills, by Versar, Inc. (Task II of EPA contract No. 68-01-4620.
 - EPA, 1973, Report to Congress on Hazardous Waste
 Disposal
 - Powers, 1976, How to Dispose of Toxic Substances and Industrial Wastes.
- 2. It can be shown that the hazardous material in question has low mobility in the specific site it is contaminating. Most solid and inert substances have low mobility. Substances with high solubilities tend to be most mobile. Mobility depends on a complex interplay of many factors and only a few substances have been studied sufficiently to predict with any degree of confidence their specific mobilities at a specific site.
- 3. The volume and/or concentration of the hazardous material is so small that there is a good probability that it will be diluted to safe (drinking water standard) levels at the point of concern.

Example for Determining the Score for Step 4.

The waste in the Poultry Processing Plant lagoon is a meat product waste, SIC number 201 and would receive a "3" rating.

DETERMINATION OF THE SITE'S OVERALL GROUND-WATER CONTAMINATION POTENTIAL

After the site has been rated on Steps 1, 2, 3 and 4, the overall ground-water contamination potential of the site can be determined by totalling these scores. This overall score allows a comparison of one site with other rated sites by indicating the general, overall contamination potential. Sites may be rated identically, yet be very different in one or several of the parameters included in the overall score; thus the overall score of Step 5 should be used with caution in assessing a particular site's potential to allow ground-water contamination. In addition, this overall score cannot be used to assess the actual amount of ground-water contamination at the site. The score is only for relative comparison with other sites. An actual determination of ground-water contamination requires an intensive on-site investigation.

EPA has not formulated an interpretation of the overall ground water contamination score other than as a relative means to prioritize sites.

Step 5. Determination of the Site's Ground-Water Contamination Potential Rating.

The site's ground-water contamination potential rating is the addition of the rating scores for the first four steps:

Contamination Potential = Step 1 + Step 2 + Step 3 + Step 4.

The highest ground-water contamination potential rating a site can receive is '29" while the lowest is '1."

Example for determining the score for Step 5.

The overall ground-water contamination potential score for the Poultry Processing Plant lagoon is determined in Step 5 by adding the scores from Steps 1, 2, 3, and 4:

Step 5 Rating = Step 1 + Step 2 + Step 3 + Step 4
=
$$9 + 4 + 5 + 3 = 21$$

DETERMINATION OF THE POTENTIAL ENDANGERMENT TO CURRENT WATER SUPPLIES

The distance from the impoundment to a ground or surface water source of drinking water and the determination of anticipated flow direction of the waste plume are used to ascertain the potential endangerment to current water supplies presented by the surface impoundment. For many assessments this step can be accomplished by measuring the horizontal distance on a 7.5 topographic map, or similar scale. In order to use this step, the anticipated direction of ground water flow within 1600 meters (1 mile) of the impoundment must be determined. Groundwater movement depends upon natural ground-water flow direction, variations due to pumping wells, mounding of the ground water beneath the site and other factors influencing flow direction, such as faults, fractures and other geologic features.

In the case of artesian wells, the anticipated flow direction of the waste plume generally would not be in the direction of the artesian well intake. Artesian wells are located in confined aquifers separated hydraulically from the surface sources of contamination by relatively impermeable confining layers, and wells tapping the confined zone generally will not be drawing ground water from upper zones.

Artesian wells should not be considered in this step unless there is an indication that the anticipated flow direction of the contaminated ground water would be in the direction of that well. To score Step 5, prioritized cases (cases A-D) have been established for rating the site according to the potential magnitude of endangerment to current sources. These priorities are detailed in Step 6 (Table VI). To score a site when a water table is nearly flat and the flow direction is indeterminable, a circle with a 1600 meter radius should be drawn around the site for designating the area of concern. In this situation the evaluator would use the same criteria, in sequential order, begining with Case A, Case B, and then Case D, eliminating Case C.

After the distance has been determined, use the Step 6 rating matrix to determine the rating under the column of the appropriate case.

TABLE VI

Step 6. Rating the Potential Endangerment to a Water Supply

Case A		Highest Priority: Rate the closest water well within 1600 meters of the site that is in the anticipated direction of waste plume movement.
Case B	· 	Second Priority: If there is no well satisfying Case A, rate the closest surface water within 1600 meters of the site that is in the anticipated direction of the waste plume movement.
Case C	-	Third Priority: If no surface water or water well satisfying Case A or B exists, rate the closest water supply well or surface water supply within 1600 meters of the site that is not in the anticipated direction of waste plume movement.
Case D	-	Lowest Priority: If there are no surface waters or water wells within 1600 meters of the site in any direction, rate the site as "OD."
Select t	he ap	propriate rating for the given distance and case:
Distance (Meters)		Case A Case B Case C Case D

Distance (Meters)	Case A	Case B Case C		Case D	
≤ 200	9A	8B	7c		
>200,≤400	7A	6B	50	-	
>400, ≤ 800	5A	48	30		
>800, ≤1600	3A	28	10	-	
>1600			-	OD	

Example for determining the score for Step 6.

The potential health hazard to existing water supply sources which the Poultry Processing Plant presents is found by determining what types of water supplies are present and their distances from the lagoon. The drilled well described in Figure 11 is for industrial water supply. Surface water (a river) is within about 30 meters of the lagoon as shown in Figure 9. Step 6 requires an estimation of the anticipated flow direction. In this example, the anticipated flow of the waste plume is to the river. The rating of Step 6 would be based on Case B, and would be scored "8B".

DETERMINING THE INVESTIGATOR'S DEGREE OF CONFIDENCE

The evaluation of a surface impoundment's ground-water contamination potential involves three steps and about twice as many separate variables. In many situations the investigator will not have comprehensive information concerning the variables and will have to evaluate the site on the basis of estimation or approximation. For this reason a rating of the investigator's confidence in scoring each step will be made. The following outline is intended to assist the investigator in rating the confidence of the data for each step, with "A" the highest confidence, "C" the lowest.

Step 1 confidence rating for determining the earth material of the unsaturated zone.

Ra	Ltu	1g

Α

Basis for Determination of Rating

Driller's logs containing reliable geologic descriptions and water level data;

U. S. Department of Agriculture soil survey used in conjunction with large scale, modern geologic maps.

Published ground-water reports on the site.

B Soil surveys or geologic maps used alone.

General ground-water reports.

Drillers' logs with generalized descriptions.

Drillers logs or exposures such as deep road cuts near the site of contamination allowing interpolation within the same general geologic unit.

C

On site examination with no subsurface data and no exposures of subsurface conditions nearby.

Estimation of water levels or geology based on topography and climate.

Extrapolations of well logs, road cuts, etc.
where local geology is not well known.
Estimation based on generalized geologic maps.
Estimations based on topographic analysis.

Step 2 confidence rating for determining the ground-water availability ranking.

This step involves the earth material categorization and thickness of the aquifer's saturated zone. The confidence rating for Step 2, Part A follows the same basis as Step 1, Part B above.

Step 3 confidence rating for determining background ground-water quality.

Rating	Basis for Determination of Rating
A	Water quality analyses indicative of background
	ground-water quality from wells at the site or
	nearby wells or springs or known drinking water
	supply wells in vicinity.

В

Local, county, regional and other general hydrogeology reports published by State or Federal agencies on background water quality.

Interpolation of background ground-water quality

Interpolation of background ground-water quality from base flow water quality analyses of nearby surface streams.

C

Estimates of background ground-water quality from mineral composition of aquifer earth material.

Step 4 confidence rating for waste character.

Rating	Basis for Determination of Rating
A	Waste character rating based on specific
	waste type.
В	Waste character rating based on SIC category.

Step 6 confidence rating for determination of the anticipated direction of waste plume movement.

Rating	Basis for Determination of Rating
A	Accurate measurements of elevations of
	static water levels in wells, springs, swamps,
	and permanent streams in the area immediately
	surrounding the site in question.
	Ground-water table maps from published State
	and Federal reports.

В

Estimate of flow direction from topographic maps in non cavernous area having permanent streams and humid climate.

Estimate of flow direction from topographic maps

in arid regions of low relief containing some permanent streams.

C

Estimate of flow direction from topographic maps in cavernous, predominantly limestone areas (karst terrain).

Estimate of flow direction from topographic maps in arid regions of highly irregular topography having no permanent surface streams.

Example for determining the confidence rating for each step.

Based upon the guidance just presented, the confidence ratings for the Poultry Processing Plant are:

Confidence Rating

Step 1	ABased upon measurement in on site
	well.
Step 2	ABased upon well logs of on site well.
Step 3	ABased upon water well analyses.

Step 4

B--Based upon SIC category.

Step 6

B-Estimate of flow direction from topographic map in humid region.

MISCELLANEOUS IDENTIFIERS

This step allows the evaluator to identify any additional significant variable not noted in the rating system. Such parameters are:

Identifier

- R The site is located in a ground-water recharge area,
- D The site is located in a ground-water discharge area,
- The site is located in a flood plain and is susceptable to flood hazard,
- E The site is located in an earthquake prone area,
- W The site is located in the area of influence of a pumping water supply well,
- The site is located in karst topography or fractured,
 cavernous limestone region.
- C The ground water under the site has been contaminated by man-made causes (i. e., road salt, feed lot, industrial waste).
- M Known ground-water mound exists beneath the site.
- I Interceptor wells or other method employed to inhibit contaminated ground-water migration (endangerment to water supply wells may be reduced).

RECORD THE FINAL SCORE

In order to present the rating scores from the previous nine steps of the evalution system in a logical manner, Step 9 provides a systematic format in which the evaluation of the site can be recorded. The nine steps are not recorded in numerical order as the focus of the evaluation is on the ground-water pollution potential score of Step 5. Thus, Step 5 is listed first, followed by Steps 1, 2, 3, 4, 6 and 8. The example of the Poultry Processing Plant waste treatment lagoon has been listed on page 63 on the following sample reporting form. The confidence scores of Step 7 have been distributed among the appropriate steps.

RATING OF THE GROUND WATER POLLUTION POTENTIAL:

STEP		9							
70	Unsat. Zone	C							
	Confidence	A							
STEP 2		4							
ס א	G. W. Avail.	C							
	Confidence	A							
STEP 3	G. W. Qual.	5							
ω τ	Confidence	A							
STEP 4	Waste	ω							
0-4	Confidence	æ							
STE	G. W. Poll.	2							
ν, ^σ	Potential								
STEP 6	Health	ω,							
	Hazard	В							
	Confidence								
Mis	æ								
l de	'n								

APPENDIX A

TYPICAL SOURCES AND TYPES OF DATA USEFUL IN APPLYING THE ASSESSMENT SYSTEM

Type of Data	Typical Sources		n deter eps	determini os		
		1_	2&3	4	6	
Property survey	County Records, property owner	*		X		
Well drillers logs	Well Driller, property owner, state records	*	*		X	
Water level measure ments	Well owners' observations, well drillers' logs, topo-graphic maps, ground water maps (reports)	*	х		*	
Topographic Maps	U.S. Geological Survey and designated state sales office				*	
Air Photos	U.S. Dept of Agriculture, U.S. Forest Service, etc.					
County Road Maps	State agencies				*	
Ground Water Reports	U.S. Geological Survey, State agencies	*	*		2	
Soil Surveys of Counties	U.S. Department of Agriculture	*	X		X	
Geologic Maps	U.S. Geological and State Surveys	X	X		X	
Waste Character	Owner/operator, State or Federal permits, SIC Code			X		

^{* -} Source of data may be especially useful

X - Source of data may be of slight use or may be used indirectly

APPENDIX B

MEASURING UNIT CONVERSION TABLE

inch (in)	x	2.54	=	centimeter (cm)
centimeter	x	0.3937		inch
feet (ft)	X	0.3048	=	meter (m)
meter	X	3, 2808	=	feet
mile (mi)	x	1. 609	=	kilometer (km)
kilometer	x	0.621	=	mile
U.S. gallon (gal)	x	0.0038	=	cubic meter (m^3)
cubic meter	x	264.17	=	U.S. gallon
cubic feet (ft ³)	x	0. 0283	=	cubic meter
cubic meter	x.	35.314	=	cubic feet
acre-foot (ac-ft)	x	123.53	=	cubic meter
cubic meter	x	0.0008	=	acre-feet
hectare	x	10,000.0	=	square meter (m ²)
square meter	. x	0.0001	=	hectare
hectare	x	2.471	=	acre
acre	x	0.4047	=	hectare
Hydraulic Conductivity				
gpd/ft ²	x	4. 72 x 10	=	cm/sec
cm/sec	x	21.2 x 10 3	=	gpd/ft ⁻²
Darcy	x	18.2	=	${ m gpd/ft}^{\ 2}$
Darcy	x	8.58×10^{-4}	=	cm/sec

APPENDIX C

GLOSSARY

- Aquifer a formation, group of formations or part of a formation that contains sufficient saturated permeable material to yield significant quantities of water to wells and springs.
- Artesian ground water synonymous with confined ground water which is a body of ground water overlain by material sufficiently impervious to sever free hydraulic connection with overlying ground water. Confined ground water is under pressure great enough to cause water in a well tapping that aquifer to rise above the top of the confined aquifer.
- Discharge area geographic region in which ground water discharges into surface water such as at springs and seeps and subsurface seepage into streams, lakes and oceans (referred to as base flow in streams).
- Karst topography geologic region typified by the effects of solution of rocks by water. Rock types most likely effected are limestone dolostone, gypsum and salt beds. Features produced are caverns, collapse features on the surface (sink holes), underground rivers and zones of lost circulation for well drillers.
- Perched water table unconfined ground water separated from an underlying body of ground water by an unsaturated zone. Its water table is a ''perched water table' and is sustained by a ''perching bed' whose permeability is so low that water percolating downward through it is not able to bring water in the underlying unsaturated zone above atmospheric pressure.
- Plume of contaminated ground water as contaminants seep or leach into the subsurface and enter the ground water, the flow of the ground water past the site of contamination causes the contaminated ground water to move down gradient. This action results in the creation of a "plume" shaped body of ground water containing varying concentrations of the contaminant, extending down gradient from place of entry. The shape of the plume of contaminated ground water is affected by attenuation of the specific contaminants and, to a lesser extent, by dispersion.
- Primary permeability permeability due to openings or voids existing when the rock was formed, i.e., intergranular interstices.

- Recharge area geographic region in which surface waters infiltrate into the ground, percolate to the water table and replenish the ground water. Recharge areas may be well defined regions such as limestone outcrops or poorly defined broad regions.
- Saturated Zone the zone in the subsurface in which all the interstices are filled with water.
- Secondary permeability permeability due to openings in rocks formed after the formation of the rock, i.e., joints, fractures, faults, solution channels and caverns.
- Unsaturated zone formerly the "zone of aeration" or "vadose zone". It is the zone between the land surface and the water table, including the "capillary fringe".
- Water table that surface in an unconfined ground-water body at which the pressure is atmospheric. Below the water table is the saturated zone and above is the unsaturated zone.

APPENDIX D

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APPENDIX G

EXAMPLES OF SECTION ONE AND TWO FORMS USED TO REPORT

THE SURFACE IMPOUNDMENT DATA

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U.S. ENVIRONMENTAL PROTECTION AGENCY

SURFACE IMPOUNDMENT ASSESSMENT (SIA)

OPERATIONAL FEATURES OF THE IMPOUNDMENT AND GROUND-WATER CONTAMINATION POTENTIAL

SECTION II

144598

SERIAL NUMBER

This form is to be completed for one impoundment per site (facility) identified in Section I, Location and Count of Impoundments Form or for one site selected via random sampling procedures. Complete multiple choice questions by entering the code number preceding the appropriate answer.

I. FACILITY IDENTIFICATION		II. PURPOSE OF IMPOUNDMENT (Enter no. in block 23)									
	SIA SITE NUMBER MENT NO.	1. Waste Storage 2. Waste Disposal 3. Waste Treatment (Specify below) 4. Other (Specify below)									
	1	SPECIFY									
10 11 - 13 14	- 18 19 - 21 22	23 24 - 34									
III, IMPOUNDMENT DESCRIPTION											
III.b is d. If answer to III.b is no. of 'no', give last year ration.	urface area of impoundment. (in acres) f. Surface area of all impoundm at this site (in acres).	g. Average influent into this impoundment (gallons per day and year of record).									
J. J	(m dc/99)	2 GALS./DAY YEAR OF RECORD									
9 40 - 43 44	- 49 50	56 22 23 - 31 32 - 35									
	III. IMPOUNDMENT DESCRIPTION (Continu	ed)									
ind year of record). i. Avera of rec	age daily influent for <u>all</u> impoundments at this facility (gallons cord).	per day and year j. Average daily effluent removed from all impoundments and discharged to streams, lakes, etc, (gallons per day and year of record).									
'EAR OF GALS₀/D	DAY YEAR OF RECORD	GALS./DAY YEAR OF RECORD									
45 – 48	49 - 57	58 - 61 62 - 70 71 - 74									
	III. IMPOUNDMENT DESCRIPTION (Continue	ed)									
eted into blocks 23 and 24.) HICKNESS IN INCHES (Enter in blocks 07. Metal 10. Buty	25 thru 27.) A Rubber Sheeting 13. Chlorinated Polyethylene	 FOR AGRICULTURAL IMPOUNDMENT GIVE AVERAGE DAILY NUMBER (in blocks 40 thru 45) AND TYPE (in block46) OF LIVESTOCK. 									
	alon Sheeting 14. Other Membrane type (Specify in blk. Indee Propylene 15. Other (Specify in blocks 28 thru 39.)	1. Cattle 2. Hogs 3. Sheep 4. Poultry 5. Other									
25 - 27 28	_ 39	40 – 45 46									
VITORING		V. GROUND-WATER DEGRADATION									
QUALITY SAMPLING FROM	a. HAVE SIGNIFICANT CHANGES IN GROUND-WATER OU OBSERVED IN ANALYSIS FROM MONITORING WELLS? and describe below how the site was corrected.)	ALITY BEEN b. HAS THE GROUND-WATER QUALITY OF DRINKING WATER WELLS IN THE									
Yearly	1. Yes 2. No 3. Unknown 4. No	Applicable I. Yes 2. No 3. Unknown 4. Not Applicable (Can only be used when there are no wells within one mile of impoundments)									
Other (Specify in blocks 50 thru 61.)	EXPLAIN:	EXP LAIN:									
- 61	62	63									
IL PATING OF THE GROUND, WA	ATER CONTAMINATION POTENTIAL (See instruction	nanual EPA 570/9-78-003) VII. WASTE IDENTIFICATION NO.									
STEP 2 STEP		STEP 6 MISCELLANEOUS Enter the waste identification number									
IL. CONFIDENCE G.W. QUAL. CO	ONFIDENCE WASTE CONFIDENCE G.W. CONTAM.	HEALTH HAZARD CONFIDENCE IDENTIFIERS for Part VI, Step 4.									
The same of the sa	and the second s										

U.S. ENVIRONMENTAL PROTECTION AGENCY

SURFACE IMPOUNDMENT ASSESSMENT (SIA)

OPERATIONAL FEATURES OF THE IMPOUNDMENT AND GROUND-WATER CONTAMINATION POTENTIAL

MONTH DAY YEAR SECTION II	TER CONTAMINATION POTENTIAL
INSTRUCTIONS: This form is to be completed for one impoundment per site (facility) identified in Section	I. Location and Count of Impoundments Form of
75 76 77 78 79 80 impoundment per site selected via random sampling procedures. Complete multiple choice questions by en	•
I. FACILITY IDENTIFICATION	II. PURPOSE OF IMPOU
STATE CNTY./CITY PLACE CATEGORY SIA SITE NUMBER MENT NO.	1. Waste Storage 2. Waste Disposal 3. Waste
	SPECIFY
1 2 3 - 5 6 - 10 11 - 13 14 - 18 19 - 21 22	23 24
III, IMPOUNDMENT DESCRIPTION	
a. Age of impound b. IS IMPOUNDMENT c. If answer to III.b is d. If answer to III.b is e. Surface area of impoundment. f. Surface area of all impoundment.	nents
ment in years. PRESENTLY USED? 'yes', give no. of 'no', give last year at this site (in acres). 1. Yes 2. NO years in operation. (in acres)	g. Average influent into this impoundment (g
	2 GALS./DAY
35 36 37 38 39 40 - 43 44 - 49 50 -	56 22 23
III. IMPOUNDMENT DESCRIPTION (Continu	
h. Average effluent for this impoundment (gallons per day and year of record). i. Average daily influent for all impoundments at this facility (gallons of record). YEAR OF YEAR OF	s per day and year j. Average daily effluent removed etc, (gallons per day and year
GALS./DAY RECORD RECORD RECORD	GALS./DAY
36 - 44 45 - 48 49 - 57	58 - 61 62
III. IMPOUNDMENT DESCRIPTION (Continues, Type of Bottom Liner (Enter no. from the types listed into blocks 23 and 24.)	· · · · · · · · · · · · · · · · · · ·
IF CLAY LINER NO. 2,3 OR 4 IS SELECTED, GIVE THICKNESS IN INCHES (Enter in blocks 25 thru 27.) 101. None 04. Chemically Modified Clay 07. Metal 10. Butyl Rubber Sheeting 13. Chlorinated Polyethylene	1. FOR AGRICULTURAL IMPOUNDME (in blocks 40 thru 45) AND TYPE (in
02. Clay 05. Concrete 08. Polyethylene 11. Hypalon Sheeting 14. Other Membrane type (Specify in blk	ts. 28 - 39.) 1. Cattle 2. Hogs 3.
03. Bentonite Modified 06. Asphalt 09. Plasticized PVC 12. Ethylene Propylene 15. Other (Specify in blocks 28 thru 39.	
3	40
IV. GROUND-WATER MONITORING	V. GROUND-WATER DEGRADATION
a. Number of moni— toring wells asso— monitoring Wells. b. FREQUENCY OF GROUND-WATER QUALITY SAMPLING FROM monitoring Wells asso— ciated with this a. HAVE SIGNIFICANT CHANGES IN GROUND-WATER QUALITY SAMPLING FROM OBSERVED IN ANALYSIS FROM MONITORING WELLS? and describe below how the site was corrected.)	UALITY BEEN b. HAS THE GROUND-WA
impoundment (if '0' 1. None 4. Monthly 7. Yearly 1. Yes 2. No 3. Unknown 4. No	ot Applicable 1. Yes 2. No 3. Unkn
question V.b.), 2. Daily 5. Quarterly 8. Other (Specify in blocks 50 thru 61.) EXPLAIN:	EXPLAIN:
3. Weekly 6. Semi-Annually	
47 48 49 50 - 61 62	63
VI. RATING OF THE GROUND-WATER CONTAMINATION POTENTIAL (See instruction	manual EPA 570/9-78-003)
STEP 1 STEP 2 STEP 3 STEP 4 STEP 5	STEP 6 MISCELLI
UNSAT. ZONE CONFIDENCE G.W. AVAIL. CONFIDENCE G.W. QUAL. CONFIDENCE WASTE CONFIDENCE G.W. CONTAM.	
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DATE PREPARED