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ORIGINAL

December 13, 1995

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Attention: 8(e) Coordinator
Office of Toxic Substances
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

Contains No CBI

8EHQ-0196-13411

RECEIVED
95 DEC 11 PM 1:09

Dear Sir:

Re: Supplement to April 5, 1995 Notification Pursuant to TSCA Section 8(e)

On April 5, 1995, Aluminum Company of America, ("Alcoa") submitted a notification pursuant to TSCA Section 8(e), reporting an elevated incidence of pituitary adenomas among workers at the Alcoa Warrick Operations smelter in Newburgh, Indiana.

Alcoa has conducted an extensive investigation of this matter, and has concluded that the rate of pituitary adenoma among Alcoa employees overall was not excessive, with about four cases per year diagnosed among 40,000 employees. There was no excess among smelter workers outside of the original cluster, or in any other job type. The study was performed by Mark Cullen, M.D., Professor of Medicine and Epidemiology at Yale University, and Harvey Checkoway, Ph.D., Professor of Epidemiology at University of Washington.

Warrick's operations were thoroughly reviewed to determine if there were unique exposures there that would not be found at other locations. The study concluded that there were no unique exposures at Warrick with the exception of a former tunnel kiln operation. A review of the chemical constituents used in the tunnel kiln operation disclosed that the exposures that were present there were not unique to that operation and would be comparable to those at other operations (namely Soderberg operations) in the aluminum industry.

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A copy of our study is enclosed for your information. Should you have any questions about this matter, please contact me at (412) 553-3513.

Very truly yours,

Daniel M. Jaffe MD

Daniel M. Jaffe, M.D.
Director, Corporate Health Services

Investigation of a Cluster of Pituitary Adenomas Among Aluminum Industry Workers

Mark R. Cullen, M.D.
Harvey Checkoway, Ph.D.
Bruce H. Alexander, Ph.D.

Background

A cluster of pituitary adenomas was identified at the Warrick smelter plant in June, 1995. All 4 cases were confirmed as pituitary adenomas based on medical records; they had been diagnosed over a 6 year period 1989-94. Analysis of job descriptions of the 4 affected workers revealed that each had had at least some contact with smelter-related job activities; such exposures were extensive in 2. Using estimates of the smelter workforce during this time period, and an estimate of the background rate for the disease (estimated 2.4/100,000 all ages) grossly corrected for age, we concluded that the Warrick smelter workers had a rate of pituitary adenoma approximately 16 fold over the background estimate. Although the sheer strength of the association was deemed a sufficient cause to proceed, the likelihood of a problem based on prior data or biologic inference was not high. Pituitary tumor has never been linked epidemiologically or in case reports to any environmental exposure. Indeed, there is no known cause for the disease other than its occurrence as part of rare familial multiple endocrine neoplasia syndromes, which are of unknown cause. In animals there is some suggestion that autonomous adenomas can be induced by chronic endocrine stimulation at the hypothalamic-pituitary level, but the relevance of this model to human experience is limited to a few case reports of patients on long-term hormonal agents who have developed the disease.

Regarding the types of exposures that are found in the smelting environment, the most interesting consideration is polycyclic aromatic hydrocarbons (PAH), based on knowledge about the historic conditions in the Tunnel Kiln. Other possible exposures of interest would be silica, fluorides, sulfur dioxide and decompositions products of coal tar pitch.

Hypotheses/Study Questions

Against this background, we undertook a further investigation of the Alcoa US experience with pituitary adenomas to address these questions:

1- Do Alcoa workers experience a higher than expected incidence of pituitary adenoma?

2- Are there particular job categories, departments or activities which are associated with a higher than expected occurrence of this disorder?

3- Is there any evidence for a work-related cause for this disorder among Alcoa workers, or any group of Alcoa workers?

Methods

In order to address these study questions, a formal investigation of pituitary tumor incidence at Alcoa North American facilities was undertaken. The overall strategy involved three steps:

1. Phase I- identification of cases and calculation of crude incidence rates for the company (U.S. plants only)

2. Phase II- elucidation of the work histories of identified cases for clues regarding possible association with facilities, job categories or exposures, using an exploratory case-control design

3. Phase III- selection of matched controls for formal case-control investigation of risk factors for pituitary adenoma among Alcoa employees.

Phase I - Incident Rate Estimation

Pituitary adenoma is not generally a lethal disease nor is it typically reportable to tumor registries (unlike other intracranial tumors). For this reason, identification of previous incident cases among Alcoa employees required the existence of a means to search medical diagnoses among Alcoa personnel. Fortunately, this was facilitated by two record systems. First, Alcoa has contracted with CHS to centrally maintain a data base of all medical encounters in North American divisions since the late 1980's . In addition, Prudential has been the largest single insurer of Alcoa workers for the past decade, and provides access to health information by diagnosis. Because of the existence of these two data bases, a search was made dating back to 1989 for all cases in each system with any

diagnosis (using ICD-9) or medical procedure code consistent with pituitary adenoma. The following codes were chosen to represent the broadest possible list of such codes, with the goal of maximizing the likelihood of identifying every incident case from all covered Alcoa employees and retirees in the system:

ICD-9 Diagnosis Codes for Pituitary Tumor; 194.3, 227.3, 237.0, 253.0, 253.1, 255.0, 255.3, 611.6. Procedure Codes for surgical and radiotherapy treatment of pituitary tumors; 07.1, 07.6, 07.7.

For each identified case by each system, an effort was made to determine whether the case was also identified by the other database, and to determine if all cases from the previously recognized cluster at Warrick were accounted for. In addition, matching of cases independently identified by management at one site (Massena) was also attempted as a secondary means to verify the completeness of case ascertainment.

Once the cases were identified, plant physicians were contacted to review plant medical records to determine whether there was evidence of pituitary adenoma documented in the record, or an alternative diagnosis which would explain how the patient had been coded, such as an endocrine disorder not caused by pituitary adenoma, or another intracranial neoplasm. If the record was insufficient to determine the patient's actual clinical diagnosis, the plant physician called the patient or family to request the information directly. On the basis of this information, a decision was made whether each identified individual in the data base was a "case" of pituitary adenoma, or had an alternative condition.

The estimated incidence of pituitary adenoma for all Alcoa employees was determined by multiplying the total number of identified cases for the six year period, and dividing by 6 times the average number of covered employees and retirees for each year. The latter figure was calculated by the benefits department. In turn, this incidence rate was compared with available figures from the US population published in the scientific literature, although no adjustments could be made for age and race.

Phase II - <u>Initial Exposure Assessment and Exploratory Case-Control Analysis</u>

In order to evaluate whether there was any association of pituitary adenoma with smelter jobs (as noted on the initial cluster) or any other department or activity, independent of the crude incidence, a preliminary case-control evaluation was performed. Cases were

the identified and medically confirmed cases ascertained as described above. Controls were the individuals whose names appeared on the initial roster of ICD and procedure codes but who proved not to have pituitary adenoma.

Work history records were obtained by abstraction of an existing work-record form maintained in uniform fashion by all Alcoa locations. For the purpose of this exploratory analysis, work records were collapsed into one of three categories: 1) full-time smelter worker; 2) part-time smelter worker (interpreted as at least one month working in the smelter environment in some job category during their Alcoa careers); or 3) non-smelter worker, implying they had never performed smelter tasks, or worked in or around smelter department or locations. For all other than the full-time smelter workers, the nature of non-smelter jobs were recorded. In addition, age, gender, hourly vs. non-hourly and retirement status at time of diagnosis were determined. Comparisons were made using contingency table analysis for each exposure and demographic variable singly. Chi-square statistics were calculated for odds-ratios different from 1.

Phase III - Formal Case-Control Study

Although no specific clues suggesting exceptional risk within this industry, nor an association with a particular work task or exposure, were uncovered during the initial phases (see below), it was decided to conduct a more formal case-control study of this population. Reasons included our desire for greater certainty regarding the preliminary conclusions, the absence of any previous literature on this disorder in the occupational setting, and the unique opportunity presented by the available data bases at Alcoa. Because virtually all cases had been ascertained primarily through the CHS data base of unified health insurance claims, and since the entire workforce and retiree group is theoretically covered by this data base, controls were randomly selected from CHS. The entire claim file for 1992, the mid-point for the six-year interval 1989-94, was searched to find five random matches for each case, based on age (within 5 years) and gender. No exclusions based on diagnosis or procedure codes were applied, nor were cases matched for any other variables such as date of hire, location of hire or occupational category.

To provide a more detailed exposure classification and to ensure that cases and controls were classified in blinded manner, all company derived employment records for the cases and the controls were entered into an electronic file by the investigators. The job titles were then classified by Alcoa industrial hygienists by the type of process: refining and chemicals; reduction; rolling and plating; extrusion and tubing; forging and casting;

wire; rod and bar; miscellaneous fabrication; and "other." The reduction processes were further classified as: potrooms; carbon plant; ingot; mechanical maintenance; electrical maintenance; power production; and "other." A second classification coded the jobs in the broader groups of: production; maintenance; salaried; and "other." Periods of extended leave, e.g., military or sick leave, were not identified.

Due to the nature of the insurance claims database, an exact date of diagnosis was not available. To ensure that work histories prior to the onset of illness were related to the risk of pituitary adenoma the work histories were truncated at 31 December, 1988. For retired workers the last entry into the work history was used as a surrogate retirement date if an actual retirement date was not available.

The duration of employment in the job and process classifications was computed for each individual. Relative risk estimates (odds ratios) were calculated to estimate the risk of a pituitary adenoma for ever being employed and employment of 5 years or more in each technology classification and type of job. To retain the matched study design in the analysis, the odds ratios and 95% confidence intervals were calculated using conditional logistic regression.

Results

Phase I - Case Ascertainment and Incidence Rate

Case ascertainment identified 51 unique Alcoa IDs, distributed at 16 North American sites. Of these, 47 were identified by the CHS data base, and 49 by the Prudential data base. One case, who had been identified by a plant manager did not appear in either base for uncertain reasons; he had died in 1989. Since he appears to have met the criteria for inclusion in the study population, he was added to the list, bringing the total to 52 subjects. All other individuals identified by plant personnel were identified, including all in the original cluster. Further investigation revealed that of the 52, 2 individuals did not meet study criteria- one was the spouse of an Alcoa employee and had never worked for Alcoa; the other had been diagnosed in 1986, three years before the study window. This left 50 individuals. Determination of the clinical status (diagnosis) for these 50 revealed that a total of 25 had evidence of having had a pituitary adenoma diagnosed between 1989 and 1994. The average age at diagnosis was 59.8, and 21 (84%) were male. The cases had been employed at 12 different Alcoa facilities.

Of the remaining 25 individuals who were identified in the initial search, evaluation including direct interview with the subject or spouse failed to yield any evidence that a pituitary adenoma had been diagnosed at any time. For these persons, alternative diagnoses were confirmed in 11: non-pituitary endocrine disorders- 2 brain tumor- 4 inflammatory bowel disease- 2 metastatic cancer to brain- 1 eye surgery- 1 depression - 1

For the remaining 14, there was insufficient information to establish any alternative diagnosis with certainty. Crude (non-age adjusted) incidence for the Corporation was calculated using an estimate of approximately 40,000 active workers and retirees for the entire 6 year period, as follows: 25/ (40,000 X 6)= 10.4 per 100,000 persons per year

Phase II - Exploratory Investigation of Exposures

For the initial exploration of job characteristics associated with pituitary adenoma at Alcoa, this group of 25 "non-cases" was chosen as a "convenience" control group. First, the two groups were compared for age, gender and retirement status to determine if the groups were suitably comparable for having the opportunity to have worked in jobs or departments which could be associated with risk for pituitary adenoma. Among the cases, 21 were men and 4 were women; among the non-cases there were 20 men and 5 women. The mean age of the cases was 59.8 (range 43-85), whereas the non-cases were slightly younger at 53.8 (range 33-85). Ten of the cases and 7 of the non-cases were retired or deceased, the remainder were active.

Classification of the cases and non cases by exposure history revealed small differences between the groups, as shown by the following tables:

	Ever-smelter	Never smelter
Cases	8 (32%)	17 (68%)
Non-cases	9 (36%)	16 (64%)

	Full-time smelter	Other
Cases	2 (8%)	23 (92%)
Non-cases	6 (24%)	19 (76%)

	Hourly	Non-hourly
Cases	19 (76%)	6 (24%)
Non-cases	16 (64%)	9 (36%)

None of these differences is statistically significant.

To explore the possibility that there could be some non-smelter tasks or activities which were more closely associated with the pituitary adenoma cases than the non-cases, the job histories of the non-full time smelters were further reviewed. These revealed a wide range of jobs, about equally split among clerical/professional (white collar), maintenance, and production workers. More importantly, the distributions of these tasks was very similar between the cases and non-cases.

Phase III - <u>Formal Case-Control Study</u>

Twenty-five (25) cases of pituitary adenoma were diagnosed in current and former Alcoa employees in the years 1989-1994. The average age of the cases years on 1 January 1992 was 57.5 compared to 58.2 for controls. The cases came from 12 different Alcoa plants and the controls represented 25 plants. The characteristics and locations of the cases and controls are described in Table 1. Odds ratios for ever having worked in each of the technology groups and job types are presented in Table 2. Table 3 provides the odds ratios for having greater than 5 years e,ployment in the technology groups and job types. In general there is little evidence of work-related association across the data set. Striking are the low odds ratios associated with smelter technologies, though none is significantly different from unity. A history of ever having been employed in a job classified as 'miscellaneous fabrication' was more common among the cases (OR=6.4, 95% CI=1.0-

39.0) (Table 2). Odds ratios were also elevated for ever employed as a maintenance worker (OR=2.5, 95% CI 1.0-6.5) and 'other' worker (OR=3.2, 95% CI=0.2-54.4), although the latter was based on one case (Table 2). The patterns were similar for employment of 5 years or more in the employment groups (Table 3).

Discussion

The data presented above have strengths and weaknesses for addressing the primary study questions. On the clearly positive side, it would appear very likely that case ascertainment has been very good. The two largely independent sources of data succeeded separately in identifying almost identical lists, which in turn included all but a single name (of questionable appropriateness) which had been identified from Alcoa sources. There is also good reason to trust the follow-back scheme, which included both review of plant medical records and direct interview of subjects and/or spouses.

Given, then, that the 25 cases represents a likely near-complete roster of incident cases (and may include some which were initially diagnosed previously), it would appear that the estimate of 10.4 cases per 100,000 workers and retirees per year during the period 1989-94 is a reasonable estimate for the population. Notably, although the original cluster has been included and accounts for 4 of the 25 cases, the overall incidence is only about 1/8th of the incidence calculated for Warrick in the initial cluster investigation.

How does this compare with the expected rate? We had selected the figure of 5 per 100,000 per year in adults as a crude estimate, based on the single published population based estimate of pituitary adenoma rates in the past two decades, a 1995 report from Olmstead County Minnesota (ref). This was derived by doubling the reported overall age adjusted rate of 2.5, observed over the period 1950-89, since that rate included children in the denominator, despite the fact that they rarely contract the disease (ref). Careful review of the full data set from Olmstead County suggests that rates were rising rapidly through the period, with an increase from 0.73 age adjusted in 1950-69, to 3.55 between 1970-89. Using the latter figure, and crudely adjusting for the absence of children in the Alcoa population, the observed rate of 10.4 is slightly high relative to expected (7.1), although better comparison data for the US population, and more precise age and gender adjustment would improve the certainty of that inference.

The job title classification attempted to group all jobs with similar exposures together. Although the original classification was specific to process and type of job, the

small sample size precluded an analysis on that level. As a result, the final analysis was made using job classifications with mixed exposures. Nevertheless, the job categories found to have an excess risk of pituitary adenoma had inherently mixed exposures, miscellaneous fabrication and the broad classification of maintenance worker. In contrast, the jobs with more specific hydrocarbon exposures, especially in reduction operations, tended to have a reduced risk of pituitary adenoma.

A concern could still theoretically be raised about the kiln furnace, since the initial study already demonstrated a higher then expected rate of pituitary adenomas among the men and women who had worked there. This aspect of the cluster is hard to completely ignore because there are no identical exposures elsewhere at Alcoa. However, we feel that the kiln furnace is unlikely to be an important cause of pituitary adenoma because the exposures there, though higher than at the later ring furnace and some other smelter facilities, is believed to involve the same groups of coal tar pitch volatile chemicals which are seen at Soderberg and other smelting operations. Notably, this study did include two facilities which had Soderbergs, yet no cases were seen among smelter workers at those locations. If coal tar pitch volatiles were a cause of pituitary adenoma, we would have expected to see some cases at these sites as well as at Warrick tunnel kiln.

A potential source of bias in our case-control study design is the source of controls. To be selected as a control a worker or retiree had to have filed a health insurance claim in 1992. Thus, the controls were chosen from a subset of the Alcoa population: those recently accessing the health care system. It is highly unlikely, however, given the innumerable reasons for seeking health care, that any particular job title was overrepresented in the controls.

An advantage of the control selection method was the ability to compare the work histories of the cases to other workers randomly selected from essentially the entire population of Alcoa workers and retirees. The success of the control sampling scheme is demonstrated by the number of plants represented in the control group.

Despite these limitations, we feel that the results of this investigation provide strong reassurance that an outbreak of pituitary adenomas related to work is not occurring at Alcoa. Although there was very minimal biologic basis for concern, we pursued this investigation because of a large excess incidence of cases occurring in relation to smelter work at Warrick. Looking now across the corporation, the overall incidence of the disease

is far lower, and the distribution of jobs is unremarkable; only 8 of 25 cases had had any exposure to smelter work (which includes the 4 previously known from Warrick), and only 2, both members of the original cluster, were full time smelter workers.

Table 1. Description of cases and controls

	Cases		Controls	
	N	%	N	%
Total	25	100.0	125	100.0
Gender				
Female	4	16	20	16
Male	21	84	105	84
Plant				
Addy	1	4.0	2	1.6
ATC	0	0.0	9	7.2
Anderson	0	0..0	1	0.8
Badin	0	0.0	5	4.0
Bauxite	2	8.0	4	3.2
Cleveland	1	4.0	9	7.2
Davenport	0	0.0	10	8.0
Edgewater	0	0.0	1	0.8
Edison	0	0.0	2	1.6
Knoxville	0	0.0	2	1.6
Lafayette	2	8.0	11	8.8
Lancaster	0	0.0	1	0.8
Marshall	0	0.0	1	0.8
Massena	3	12.0	7	5.6
New Kensington	2	8.0	1	0.8
Pittsburgh	2	8.0	6	4.8
Pt. Comfort	0	0.0	6	4.8
Richmond	1	4.0	1	0.8
Rockdale	1	4.0	7	5.6
San Diego	0	0.0	1	0.8
Tennessee	4	16.0	11	8.8
Vancouver	0	0.0	1	0.8
Vernon	0	0.0	6	4.8
Warrick	4	16.0	18	14.4
Wenatchee	2	8.0	2	1.6
Age (mean) (1992)	57.5		58.2	

Table 2. Pituitary Adenoma Cases and Controls by Exposure

	Case		Control			
	N	%	N	%	OR	95% CI
TECHNOLOGY TYPE						
Refining/Chemicals						
Ever	2	8.06	6	4.8	1.72	0.33-9.07
Redcution						
Ever	9	36.0	42	33.6	1.12	0.45-2.80
Rolling/plating						
Ever	6	24.0	31	24.8	0.96	0.36-2.56
Extrusion/Tube						
Ever	2	8.0	13	10.4	0.77	0.17-3.41
Forging/casting						
Ever	1	4.0	15	12.0	0.32	0.04-2.5
Misc. Fabrication						
Ever	3	12.0	3	2.4	6.36	1.04-39.0
Wire rod and bar						
Ever	1	4.06	6	4.8	0.83	0.10-6.92
Other Technology						
Ever	11	44.0	52	41.6	1.10	0.47-2.60
REDUCTION TECHNOLOGIES						
Reduction production						
Ever	4	16.0	33	26.4	0.50	0.15-1.65
Reduction mintenance						
Ever	2	8.0	13	10.4	0.75	0.16-3.55
Reduction production and maintenance						
Ever	6	24.0	39	31.2	0.67	0.24-1.89
JOB TYPE						
Maintenance						
Ever	13	52.0	40	32.0	2.52	0.99-6.45
Other						
Ever	1	4.02	2	1.6	3.16	0.18-54.4
Production						
Ever	16	64.0	81	64.8	0.96	0.38-2.44
Salaried						
Ever	10	40.0	40	32.0	1.44	0.58-3.53
Total 25	100.0	125	100.0			

Table 3. Pituitary Adenoma Cases and Controls by Years of Exposure

	Case		Control			
	N	%	N	%	OR	95% CI
TECHNOLOGY TYPE						
Refining/Chemicals						
5+	2	8.0	5	4.0	2.11	0.38-11.84
Reduction						
5+	4	16.0	33	26.4	0.53	0.17-1.66
Rolling/plating						
5+	5	20.0	27	21.6	0.91	0.31-2.64
Extrusion/tubing						
5+	2	8.0	10	8.0	1.0	0.22-4.56
Forging/casting						
5+	1	4.0	15	12.0	0.32	0.04-2.48
Misc. fabrication						
5+	3	12.0	3	2.4	6.36	1.04-39.00
Wire rod & bar						
5+	0	0.0	6	4.8	0	—
Other						
5+	9	36.0	33	26.4	1.55	0.63-3.80
REDUCTION TECHNOLOGIES						
Reduction production						
5+	2	8.0	21	16.8	0.42	0.09-1.95
Reduction maintenance						
5+	0	0.0	7	5.6	0	—
Reduction production and maint						
5+	2	8.0	29	23.2	0.29	0.64-1.29
JOB TYPE						
Maintenance						
5+	7	28.0	26	20.8	1.52	0.55-4.20
Other						
5+	1	4.0	0	0.0	—	—
Production						
5+	10	40.0	73	58.4	0.46	0.19-1.13
Salaried						
5+	9	36.0	34	27.2	1.51	0.61-3.74
Total	25	100.0	125	100.0		

CECATS/TRIAGE TRACKING DBASE ENTRY FORM

CECATS DATA:
Submission # 8EHQ- 0196 -13411 SEQ.____

TYPE: INT. SUPP FLWP

SUBMITTER NAME: Aluminum Company of America

SUB. DATE: 12/13/95 OTS DATE: 01/11/96 CSRAD DATE: 03/11/96

INFORMATION REQUESTED: FLWP DATE:
0501 NO INFO REQUESTED
0502 INFO REQUESTED (TECH)
0503 INFO REQUESTED (VOL ACTIONS)
0504 INFO REQUESTED (REPORTING RATIONALE)

DISPOSITION:
(0639) REFER TO CHEMICAL SCREENING
0678 CAP NOTICE

VOLUNTARY ACTIONS:
(0401) NO ACTION REPORTED
0402 STUDIES PLANNED/UNDERWAY
0403 NOTIFICATION OF WORKER/OTHERS
0404 LABEL/MSDS CHANGES
0405 PROCESS/HANDLING CHANGES
0406 APP./USE DISCONTINUED
0407 PRODUCTION DISCONTINUED
0408 CONFIDENTIAL

CHEMICAL NAME: CAS#

INFORMATION TYPE:		P F C
(0201)	ONCO (HUMAN)	01 02 04
0202	ONCO (ANIMAL)	01 02 04
0203	CELL TRANS (IN VITRO)	01 02 04
0204	MUTA (IN VITRO)	01 02 04
0205	MUTA (IN VIVO)	01 02 04
0206	REPRO/TERATO (HUMAN)	01 02 04
0207	REPRO/TERATO (ANIMAL)	01 02 04
0208	NEURO (HUMAN)	01 02 04
0209	NEURO (ANIMAL)	01 02 04
0210	ACUTE TOX. (HUMAN)	01 02 04
0211	CHR. TOX. (HUMAN)	01 02 04
0212	ACUTE TOX. (ANIMAL)	01 02 04
0213	SUB ACUTE TOX (ANIMAL)	01 02 04
0214	SUB CHRONIC TOX (ANIMAL)	01 02 04
0215	CHRONIC TOX (ANIMAL)	01 02 04

INFORMATION TYPE:		P F C
(0216)	EPI/CLIN	01 02 04
0217	HUMAN EXPOS (PROD CONTAM)	01 02 04
0218	HUMAN EXPOS (ACCIDENTAL)	01 02 04
0219	HUMAN EXPOS (MONITORING)	01 02 04
0220	ECO/AQUA TOX	01 02 04
0221	ENV. OCCC/REL/FATE	01 02 04
0222	EMER INCI OF ENV CONTAM	01 02 04
0223	RESPONSE REQEST DELAY	01 02 04
0224	PROD/COMP/CHEM ID	01 02 04
0225	REPORTING RATIONALE	01 02 04
0226	CONFIDENTIAL	01 02 04
0227	ALLERG (HUMAN)	01 02 04
0228	ALLERG (ANIMAL)	01 02 04
0239	METAB/PHARMACO (ANIMAL)	01 02 04
0240	METAB/PHARMACO (HUMAN)	01 02 04

INFORMATION TYPE:		P F C
0241	IMMUNO (ANIMAL)	01 02 04
0242	IMMUNO (HUMAN)	01 02 04
0243	CHEM/PHYS PROP	01 02 04
0244	CLASTO (IN VITRO)	01 02 04
0245	CLASTO (ANIMAL)	01 02 04
0246	CLASTO (HUMAN)	01 02 04
0247	DNA DAM/REPAIR	01 02 04
0248	PROD/USE/PROC	01 02 04
0251	MSDS	01 02 04
0299	OTHER	01 02 04

TRIAGE DATA:	NON-CBI INVENTORY	ONGOING REVIEW	SPECIES	TOXICOLOGICAL CONCERN:	USE:	PRODUCTION:
	YES (CONTINUE)	YES (DROP/REFER)		LOW		
	NO (DROP)	NO (CONTINUE)		MED		
	DETERMINE	REFER:		HIGH		

COMMENTS: