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# KISKI VALLEY HEALTH SURVEY LEECHBURG, PENNSYLVANIA

1997

Prepared for:  
Kiski Valley Coalition  
To Save Our Children

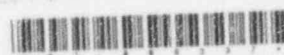
Prepared by:  
ECO Foundation, Inc

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# KISKI VALLEY HEALTH STUDY

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## 1.0 EXECUTIVE SUMMARY

A comprehensive interactive health survey of individuals graduating from Leechburg High School, Leechburg, Pennsylvania has been undertaken by the ECO Foundation, Inc. at the request of the Kiski Valley Coalition To Save Our Children. The health survey was mailed to approximately four thousand graduates representing target years prior to, during and after operations at the nearby Parks Township Babcock & Wilcox nuclear fuels processing facility. Eight hundred and ninety-two (892) responses were received and compiled into a computerized data base. The data base was utilized to reflect every self reported incidence of health problems and abnormalities, which are reported herein.

This health survey limits its reporting to presentation of gross results. These results are reported and intended for use for preliminary screening and decision making purposes only. Ultimate conclusions regarding community health, and factors that may be assumed to have impacted community health will require intensive additional study to include invasive sampling techniques such as collecting blood and tissue samples and is beyond the intended and actual scope of this survey.



## 2.0 SURVEY METHODOLOGY

This survey attempts to track general health of graduates of the Leechburg High School during specific time periods prior to, during and after active operations at the Babcock & Wilcox nuclear fuels processing facility. The need for gathering such data was prompted by anecdotal evidence suggesting a relatively high incidence of ill health among residents in the area, especially with cancers, thyroid disease and reproductive difficulties of the type that may be attributable to exposure to radiation. The sole purpose of the health survey is to provide preliminary numerical information that can be utilized in addition to anecdotal accounts for the purposes of determining if the health of individuals exposed to nuclear and other industrial operations in the Kiski Valley merits additional monitoring and intervention.

A database of graduates in the target years was composed from information supplied by members of the Kiski Valley Coalition To Save Our Children. Coalition members worked with class presidents, reunion committees and school officials to locate current addresses for all graduates from the target years. No verification of the actual percentage of individuals correctly identified and contacted is available due to the absence of a comprehensive data base at the school. Approximately four thousand individuals thought to be Leechburg high school graduates from the target years were eventually identified and included in the survey population. Of the approximately 4,000 surveys mailed, 22 were returned as being incorrectly addressed or undeliverable. This relatively low rate of incomplete delivery confirms the adequacy of both the initial database of individuals and addresses, and the software utilized to highlight and correct that database in preparation for generating mailing labels.

An additional outreach effort included posting notices regarding the survey in various local newspapers. Graduates interested in participating in the study were given the opportunity to call and request a survey. Numerous individuals requested surveys as a result of this follow-up advertising and publicity, as well as word of mouth canvassing by Coalition members.

The survey itself is based on a interactive survey form developed by Rosalie Bertell, Ph.D., CNSH, of the International Institute of Concern For Public Health.<sup>1</sup> A copy of Dr. Bertell's original survey tool is included as Appendix A. The survey form utilized in the Kiski Valley Health study was slightly modified to provide a more compact survey, and to exclude some highly personal information which may have proved objectionable to the participants. A copy of the Kiski Valley survey is included as Appendix B. The survey was accompanied by an introductory and explanatory letter from Coalition President, Jack Bologna, and included the ECO Foundation, Inc. address, phone number and instructions to contact the Foundation for further information or assistance in completing the form. The surveys were mailed with pre-addressed, postage paid envelopes to eliminate any potential cost or inconvenience to responding survey participants.

Eight hundred ninety-two (892) completed surveys were returned to ECO. Each survey was assigned an unique identification number. The assigned number was utilized in the database processing to allow cross referencing to originals while maintaining participant confidentiality.

Survey information was transferred from originals into a master database that compiled all survey information with the exclusion of personal data such as names, addresses and phone numbers. Data transfer was done by professional data entry staff subcontracted for this project. Database integrity was ensured by protecting data entry cells to prevent inclusion of incorrect information in data fields. For instance fields that were to contain a date would only allow numeric entries, and fields that were to contain a yes or no response would only allow entry of letters. The completed database was checked by auditing the fields through the Microsoft Excel filter utility, auditing selected records against information contained in the surveys and by proof reading hard copy of the complete data base. The completed database has been formatted in Microsoft Access 2.0, and will be made available to the Coalition for distribution at their discretion. The original surveys, which were maintained by ECO in secured, monitored storage will be returned to the Coalition for permanent storage.

All numbers reported have been calculated and compiled by the Access software from the information included on the master database. Therefore, all results reported are strictly numeric, and have not been subject to either editing or interpretation by any party.

### 3.0 DIFFICULTIES ENCOUNTERED

A major difficulty encountered resulted from participants failing to fully and accurately complete the survey form. In numerous instances, participants self reported the incidence of one of the survey listed conditions, but failed to note the date of first occurrence or diagnosis as per the survey instructions. The data entry program required notation of this information to reflect the incidence of a particular condition, and in the absence of the required date merely noted a yes for the problems section under the general systems heading. For instance, a person noting arthritis, but failing to provide a date of first occurrence would only reflect as a yes value under the general heading of any conditions of muscles and bones. Because of this limitation, the master database provides a better general view, and is less accurate for specific conditions.

The major exception to this difficulty was with the cancer category. Virtually every participant responding as positive for the occurrence of cancer provided both a date of diagnosis, as well as the name of the diagnosing physician. Therefore, this crucial category of information is unaffected by this particular difficulty.

Inconsistent and inappropriate responses created an additional difficulty. Instances of participants replying no for any conditions, but going on to provide a diagnosis date for a specific condition were encountered. This difficulty was resolved by entering yes under the major conditions where a diagnosis date was given, and leaving the no answer where no specific date was provided.

Inconsistent information, such as females answering male only questions was excluded where all other data provided appeared relevant and trustworthy. No other interpretation or editing of data occurred. Even in cases where answers seemed unlikely, data was recorded as presented on the original survey.



A small number of surveys were completed and returned without names, addresses or other identification. In all cases, these surveys were handwritten, contained information which appeared feasible, and reasonably detailed, and was therefore included in the master database. Reference through identification number back to the original surveys would allow for this information to be deleted from future consideration of the compiled data if so desired.

Where participants either declined or neglected to answer a question, no data was entered for the non-responsive questions. This leads to a differing response rate for each of the questions. Response rates are noted in the narrative discussion of the survey results contained herein at Section 4.0.

A number of surveys were returned which reflected the don't know option for every question. As per stated protocol, these surveys were recorded as received. However, because these ambiguous responses tend to decrease more useful information, and because it seems unlikely that a person would be totally ignorant about the status of his or her health, this data may require reevaluation, to include interviewing respondents to ensure complete integrity of the health data.

Due to the format of the survey itself, which largely required checking boxes, there was little difficulty in distinguishing or interpreting individual handwriting. Survey information integrity was preserved to the point of entering conditions noted utilizing the exact terminology and spelling provided by the survey participant.

#### 4.0 COMPILATION OF SURVEY RESPONSES

Numeric information and a graphical presentation of information is presented for each of the major questions and physical systems touched upon by the survey.

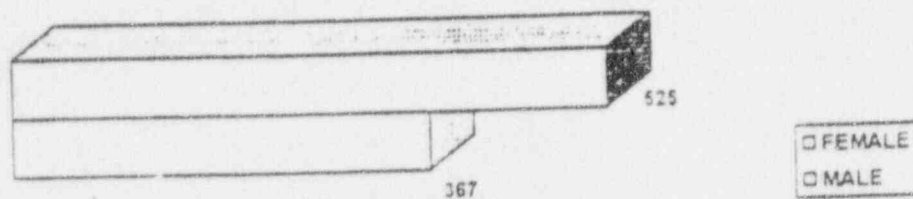
The master database provided the source for the presented numbers which were tabulated by the filter utility of Microsoft Excel software. Presentation of data as a percentage based pie graph was accomplished through use of the Microsoft Graph 5.0 utility contained the Microsoft Word for Windows 6.0 software. Numbers and graph presented are therefore dependent on the integrity of the database. Because the master database contains over 500,000 separate fields of information, it is certain that some small percentage of information may be improperly entered. This has the potential to affect the information presented below. Therefore, despite aggressive measures to protect the integrity of the data as detailed above, this information compilation should be viewed as representative of the survey responses provided, rather than an absolute tabulation of those responses. All responses as recorded have been reflected into the master database.

#### 4.1 General Information

As noted above personal information such as names, addresses and telephone numbers has been excluded from the master data base and this report in order to maintain confidentiality. Identification numbers which reference back to the original surveys have been substituted throughout.

Of 892 survey participants, 892 answered question A3 asking for the sex of the respondent. 525 females and 367 males were recorded as survey participants.

KISKI VALLEY HEALTH SURVEY RESPONDENTS BY SEX



573 females responded to question A4 asking for height. The average height of these respondents was 64.4 inches. 365 males answered question A4. The average height recorded among males responding to the question was 70.4 inches.

494 females provided answers to question A5 asking for weight. Of responding females, the average weight was 149 pounds. 367 males gave responses for weight, with an average recorded weight of 188 pounds.

Survey question A6 asked for the participants years of education in numeric form. 379 survey participants responded, with an average educational level of 13.9 years, which translates to high school graduation as well as some secondary schooling.

Date of high school graduation as asked in question A7 varied for each participant, and is reflected on the master data base print out sheets.

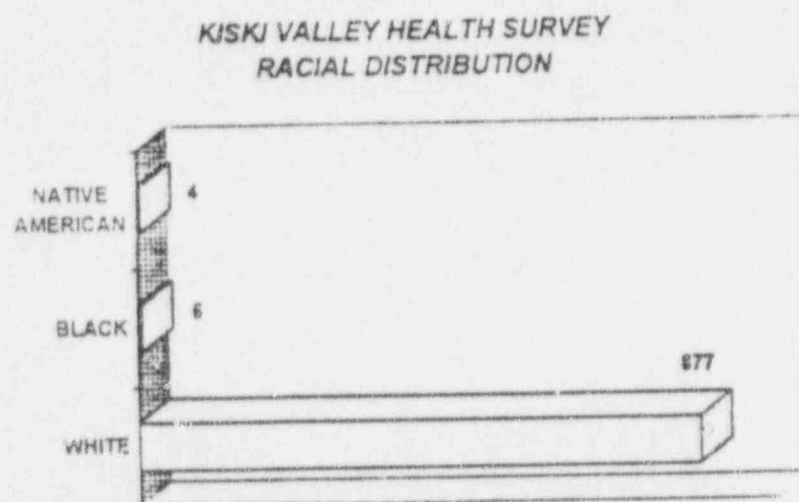
105 of the individuals surveyed served in the armed forces with the following distribution among the various branches:

| <i>SERVICE</i> | <i>NUMBER RECORDED</i> |
|----------------|------------------------|
| ARMY           | 57                     |
| NAVY           | 11                     |
| AIR<br>FORCE   | 17                     |
| MARINES        | 15                     |
| OTHER          | 5                      |

7 survey participants reported that they were still on active duty with one of the branches of the armed services.

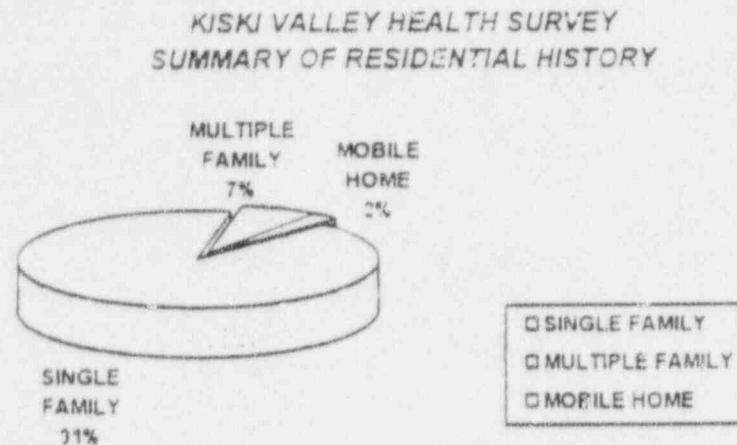


Survey question A10 inquired about the predominant ethnic heritage of survey participants. It should be noted that ethnic and racial make-up is considered to be an important factor in the incidence of some diseases and disorders. Researchers have noted substantial differences in the rate and severity of various disease in different racial and ethnic groups. However, it is difficult to distinguish whether and to what extent these differences are due to lifestyle versus genetics. 886 survey participants provided a racial description. Of those, 877 described themselves as White, 6 as Black, 4 as Native American and 1 as other.



Question A11 asked for annual household income. Only 258 survey respondents were willing to provide this information, which was tagged as optional. Again, the question was included in the survey because there appear to be marked differences in the occurrence and outcome of disease and disorders based on income. Intuitively this makes sense. Affluent individuals are more likely to have access to more, and better quality health care, as well as being able to sustain a potentially healthier lifestyle than less affluent persons. Of individuals willing to report income, the average annual household income was \$ 54,735.00.

882 survey participants gave answers to question A12 seeking information on housing types. 779 individuals responded that they occupied single family housing. 62 reported living in multiple family dwellings, and 21 participants resided in mobile homes.



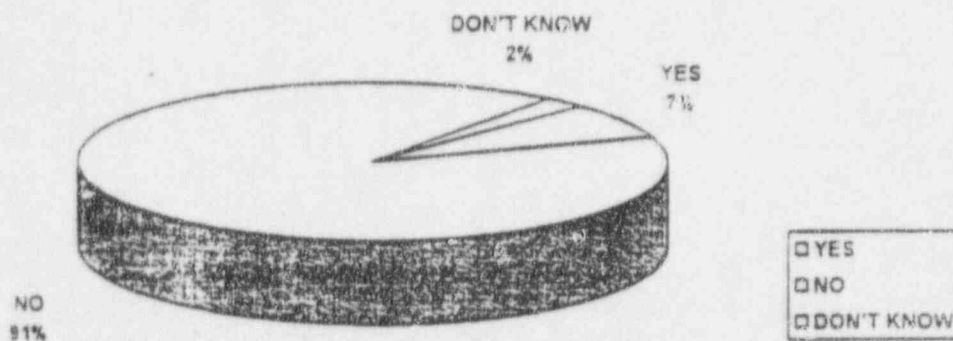
Survey question A13 asked the participant's drinking water supply. 879 persons answered this question, with a majority 729 relying on municipal or supplied water. 126 individuals reported utilizing a well for potable water, and 24 individuals listed bottled water as their primary source for drinking water.

875 survey participants provided numeric responses to question A14 inquiring about the length of residence in the Leechburg area. Of those providing responses, the average length of residence in the area was recorded as 27.85 years.

An average of 3.1 persons resided in the households of the 871 survey participants responding to question A16.

Survey question A17 sought information regarding any occurrences of cancer in survey respondents or their children. 857 individuals are recorded as having provided responses. 777 recorded no cancer occurrences; 62 noted cancers in themselves or children and 18 responded with the don't know option. Percentages for each of the recorded responses to question A17 are as follows:

**KISK: VALLEY HEALTH STUDY  
REPORTED CANCER OCCURRENCE**



## 4.2 Medical Information

The survey divided medical information into sections by physiological systems. Information regarding specific diseases and disorders was asked for in each section, as well as providing an opportunity to list other diseases that responders may have felt were relevant to the subject heading. The information compiled below is for major headings. Information regarding the rates of reported occurrence for specific disorders can be obtained from the master database.

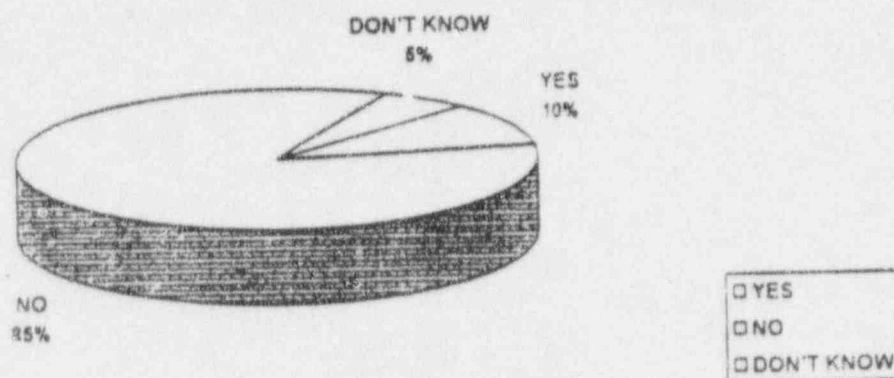


## 4.2.1

## Lung

Question B1 recorded responses about the rate of occurrence of problems related to the lungs. 884 individuals completed this question. 670 reported no lung complaints. 89 noted lung disorders. 48 responded using the don't know option.

KISKI VALLEY HEALTH SURVEY  
REPORTED OCCURRENCE OF LUNG CONDITIONS

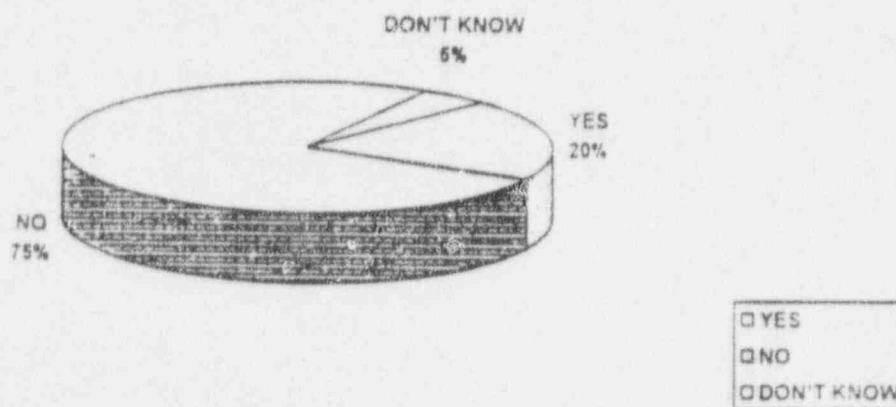


#### 4.2.2

#### Cardiovascular System

Survey question B2 collected information regarding the cardiovascular system. 386 survey participants provided answers to this question category. 670 reported no conditions or disease of the cardiovascular system. 176 participants reported the occurrence of conditions or symptoms related to the cardiovascular system. 40 individuals chose the don't know response option.

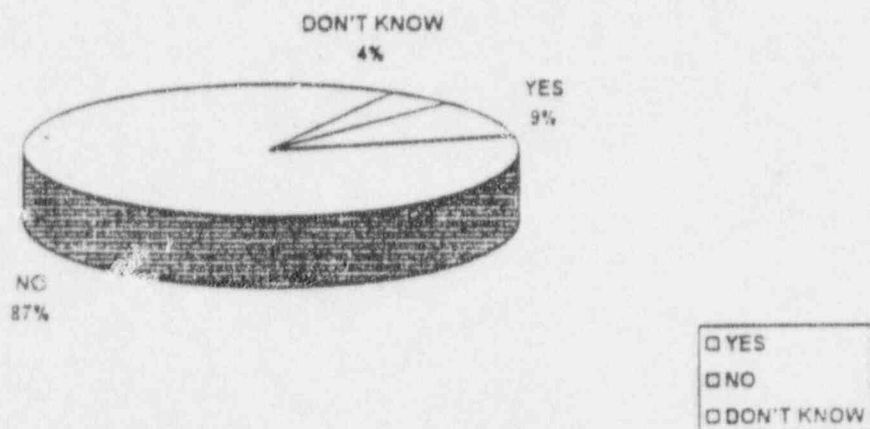
KISKI VALLEY HEALTH SURVEY  
REPORTED OCCURENCE OF CARDIOVASCULAR CONDITIONS



#### 4.2.3 Blood

A total of 873 participants answered question B3 and its relevant subparts relating to conditions of the blood. 755 experienced no conditions of the blood. 81 reported that they had experienced one or more conditions associated with blood systems. 3% of those responding to the question utilized the don't know option.

KISKI VALLEY HEALTH SURVEY  
REPORTED OCCURRENCE OF BLOOD CONDITIONS

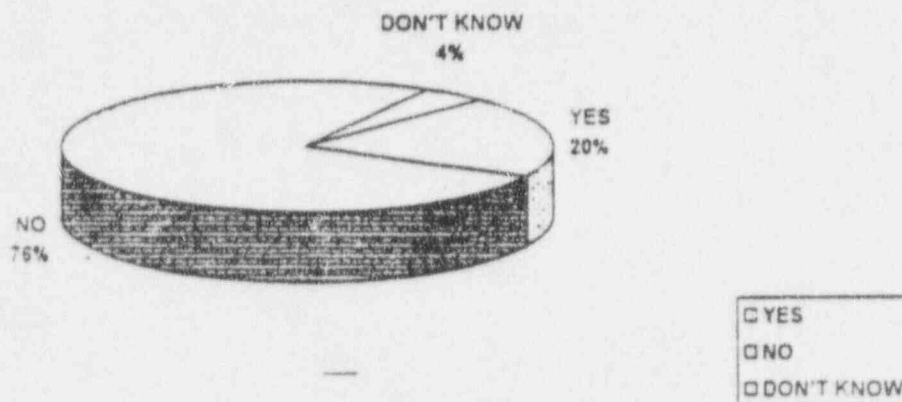


#### 4.2.4

#### Digestive System

Survey question B4 compiled information regarding digestive system health. 882 persons answered question B4. 666 reported no digestive system conditions or symptoms. 177 recorded a variety of conditions relevant to the digestive tract. 36 participants responded to the question with don't know.

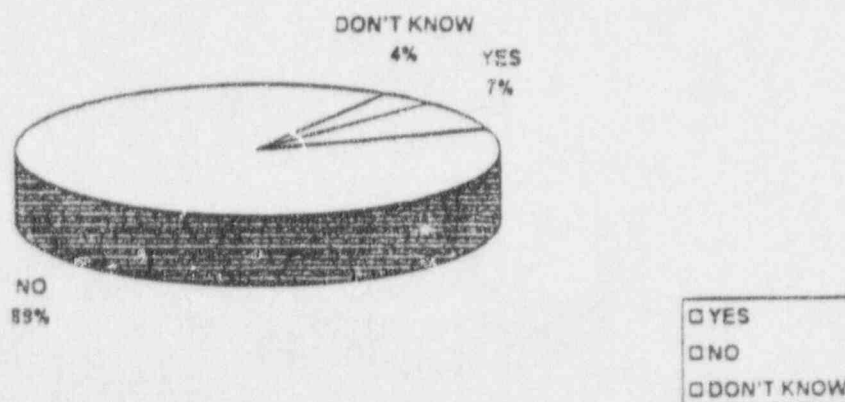
KISKI VALLEY HEALTH SURVEY  
REPORTED OCCURENCE OF DIGESTIVE TRACT CONDITIONS



#### 4.2.5 Urinary Tract

Information regarding urinary tract health was collected in survey question B5. A total of 882 participants provided responses. 786 of those responded no. 64 answered B5 with yes, and 32 checked the don't know option line.

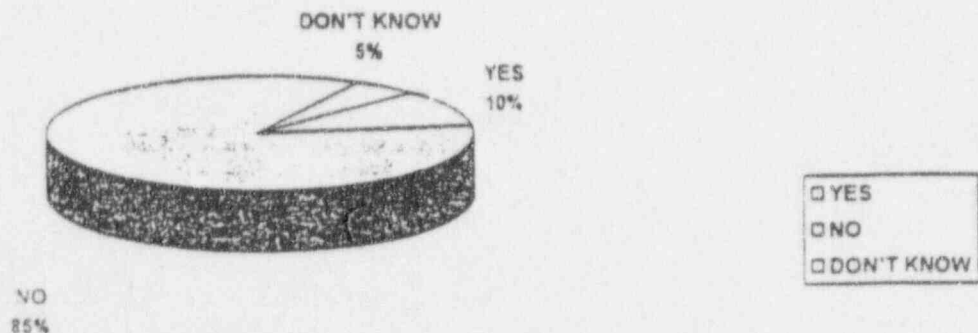
**KISKI VALLEY HEALTH SURVEY  
REPORTED OCCURENCE OF URINARY TRACT CONDITIONS**



## 4.2.6

*Endocrine System*

The endocrine system is composed of glands which secrete the hormones which create the chemical environment necessary for our bodies to function properly. Question B6 surveyed the occurrence of endocrine system or glandular conditions. 869 people completing the survey provided answers for this question and its subsections. Of those, 739 reported that they had experienced no endocrine system conditions. 89 reported having experienced endocrine system conditions, at some point in their lives. 41 individuals selected don't know as the appropriate response to this question. Of particular note, 46 survey participants specifically noted thyroid conditions ranging from abnormal thyroid activity to thyroid cancer.

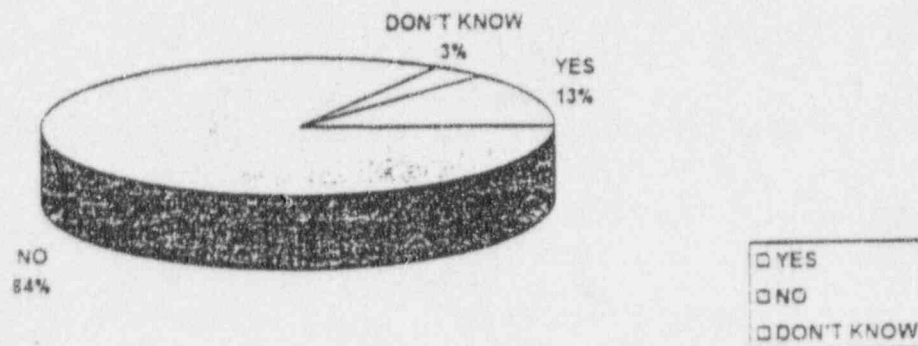




#### 4.2. Skin

Survey participants provided 878 total responses on questions related to skin conditions. 737 of those participants responded that they had not been affected by any skin conditions. 122 reported the occurrence of various conditions of the skin, while 29 responders chose to answer with the don't know option.

**KISKI VALLEY HEALTH STUDY  
REPORTED OCCURRENCE OF SKIN CONDITIONS**

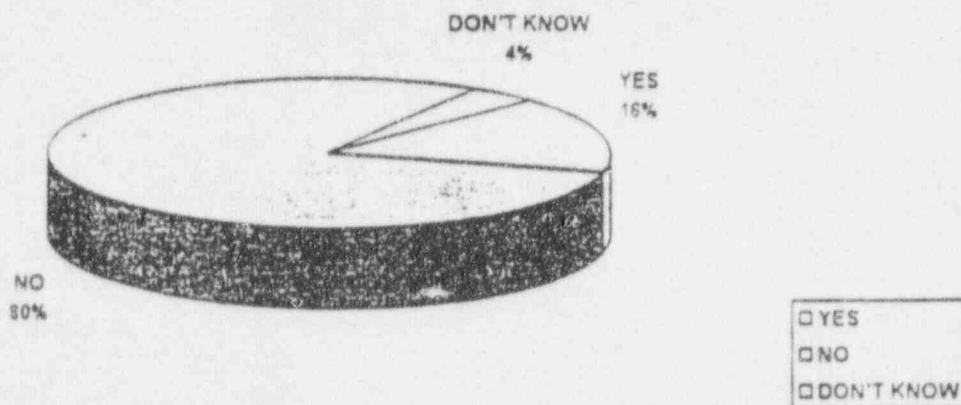


#### 4.2.8

#### *Muscles and Bones*

Information on common conditions of the muscles and bones was compiled in survey question B8. 737 responders indicated that they had never experienced conditions of the muscles or bones. 112 participants noted conditions of the muscles and /or bones, with arthritis being the most commonly cited condition. 41 people answered this question with the don't know response. A total of 879 survey participants provided an answer to this question and its subsections.

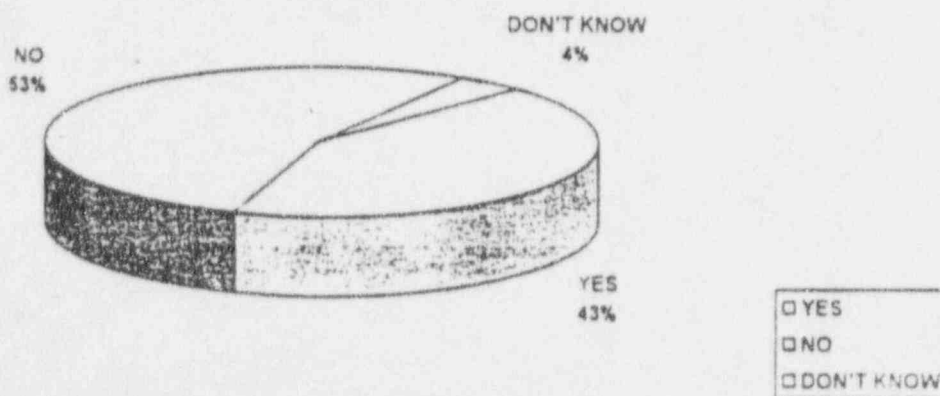
**KISKI VALLEY HEALTH SURVEY  
REPORTED OCCURRENCE OF MUSCLE AND BONE CONDITIONS**



#### 4.2.9 Head and Neck

880 people participating in this survey answered question B9, providing information about conditions of the head and neck. 477 no responses were recorded. 380 positive responses were counted with the majority of responders reporting that they had experienced the need for vision corrective lenses. 23 individuals provided a don't know response.

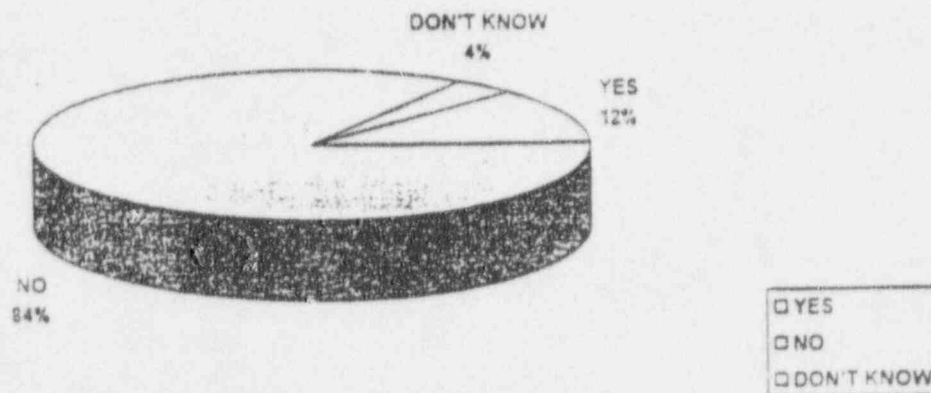
**KISKI VALLEY HEALTH SURVEY**  
**REPORTED OCCURRENCE OF HEAD AND NECK CONDITIONS**



#### 4.2.10 Nervous System

When all responses for question B9 regarding nervous system conditions and symptoms were totaled, 881 responses were received. 742 of those responders failed to note any nervous system conditions or symptoms. 106 survey participants reported conditions or symptoms related to this system, and 33 checked the don't know response line.

KISKI VALLEY HEALTH SURVEY  
REPORTED OCCURRENCE OF NERVOUS SYSTEM CONDITIONS



#### 4.2.11 *Immune System*

The body's immune system helps to fight infection, and the importance of proper immune functioning has been demonstrated by the devastating health effects noted in AIDs patients with severely compromised immune systems. Questions relating to the immune system and common auto-immune disease were presented in survey question B11. 881 responses were received regarding immune system conditions and symptoms. 594 participants recorded no conditions or symptoms relevant to this category. 256 reported that they had at sometime experienced immune system symptoms. The most common specific conditions noted were allergies and frequent colds. 31 don't know responses completed this data set.

Question B12 allowed survey participants to note other conditions, disorders diseases or symptoms that they felt were worthy of note, and had not been included in the other medical questions contained in the survey. 865 individuals provided a response to question B12. The response broke down as follows: 636 no; 187 yes; 42 don't know.

Question B13 regarding genetic defects in off-spring of survey participants proved to be an ambiguous question in that many participants who did not list themselves as having children nonetheless provided a no response to this question. In evaluating the survey responses, it became apparent that a not applicable option would have been most appropriate for this category, and it is strongly suggested that such changes be made to the survey tool for any future uses. 45 survey participants responded that their children were affected with various genetic defects. A complete listing of the genetic defects noted are included in the master database.



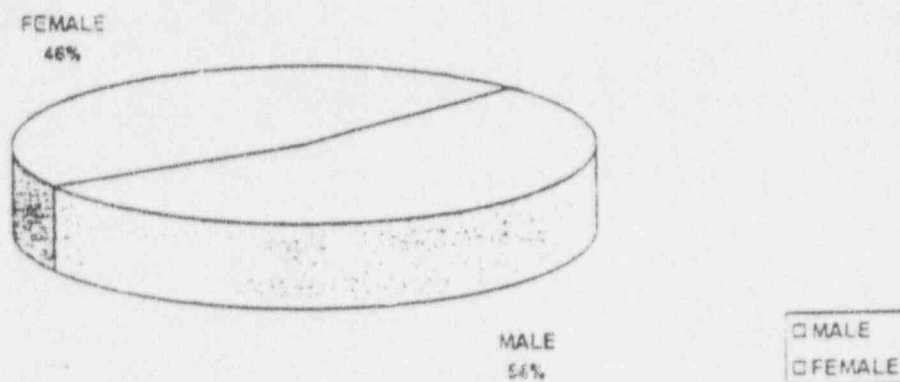
#### 4.2.14 *Reproductive System*

Likewise the B13 female only question proved to be problematic. Many survey respondents rightfully answered yes for any conditions noting that pregnancy was listed as a subsection of this question. Upon review of the compiled information this design flaw in the survey tool became evident. Therefore, due to these difficulties inherent to the survey tool, pregnancy, a perfectly natural condition, is categorized with other disorders and ailments that are considered as pathologies. The data as supplied included a total of 476 answers. 276 women reported no conditions under this heading. 187 responded with a yes that may not be reflective of actual incidence of disease or disorder among survey participants for the reasons discussed herein. 17 female respondents chose the don't know response.

Question B14 touched on male reproductive system conditions. This question was free from the likelihood of ambiguous response that influenced the female reproductive system information. 332 male survey participants answered question B14. 276 recorded no reproductive system conditions. 15 noted conditions among the various heading subsections. 41 male responders replied to this question with don't know.

Both male and female reproductive histories were solicited by the survey. For all survey participants, 1,101 live births were recorded. Of the reported live births, 65 were characterized as low birth weight and 73 as premature births. Among females, 823 pregnancies were reported with 117 resultant miscarriages. The sex distribution reported was as follows: 508 female children; 593 male children reported.

*KISKI VALLEY HEALTH SURVEY  
SEX RATIO REPORTED FOR OFF-SPRING*



Some community health researchers have noted a skewing of the sex ratios in communities exposed to radiation. However, the ratio previously reported incidental to chronic radiation exposure favored females.<sup>2</sup>

#### *4.2.15 Radiation History*

Question B15 related to individual history of radiation in the form of medically prescribed x-rays for screening, diagnostic and therapeutic purposes. 862 respondent's answered this question. 802 indicated that they had some past history of medical radiation exposure. 48 individuals did not record any history of having been exposed to x-rays or medical radiation. 12 survey participants responded that they did not know the status of possible past exposure.

#### *4.2.16 General Health*

Question B16 was designed to allow the respondent to give his own, undirected assessment of the general condition of his or her health. 844 survey respondents participated in this rating of their health. 345 characterized their health as being excellent. 429 ratings of good health were recorded. 61 individuals described themselves as being in fair health, while only 9 people rated their general health as poor.

### 4.3 Occupational Exposure

Question C1 and its related subsections were designed to survey various occupational exposures to various chemicals known to influence human health, as well as to gauge the length of individual exposures to these chemicals. 838 responses were received on occupational history. Of those, 389 participants did not believe that they had been exposed to potentially harmful chemicals in the course of their employment. 270 individuals recorded exposure to at least one potentially harmful chemical as a result of their jobs. 179 of those individuals providing a response to this question did not know if they had been exposed to chemical agents at their workplaces.

#### 4.4 Residential and Lifestyle History

Environmental and lifestyle factors are known to influence health, and the occurrence of disease. Survey respondents providing information in this regard provided important information that will be vital in ultimately evaluating the data produced as a result of the Kiski Valley Health study.

##### *4.4.1 Water*

356 of the people responding to this survey reported that their drinking water looked, smelled and/or tasted unusual at some point in time. Out of 865 responses, 302 individuals reported that their drinking water had been tested, 275 respondents believed that their drinking water had not been tested, and 288 did not know whether testing had ever been performed.

#### 4.4.2 Air

The following responses were made regarding air quality in the areas where survey respondents reside:

#### KISKI VALLEY HEALTH STUDY RESPONSES REPORTED FOR AIR QUALITY

| DESCRIPTION OF AIR QUALITY |      |          |           |                         |                       |                 |               |       |
|----------------------------|------|----------|-----------|-------------------------|-----------------------|-----------------|---------------|-------|
| Clear                      | Haze | Lt. Smog | Mod. Smog | Occasional smoke - dust | Frequent smoke - dust | Occasional Odor | Frequent Odor | Other |
| 605                        | 103  | 64       | 16        | 133                     | 21                    | 104             | 7             | 4     |

#### 4.4.3 Smoking

Questions regarding smoking history were segregated by smoking material. For each question regarding smoking, 891 survey respondents provided yes or no responses as follows:

|     | CIGARETTES | CIGARS | PIPE |
|-----|------------|--------|------|
| YES | 359        | 55     | 35   |
| NO  | 532        | 836    | 856  |



#### 4.4.4 *Alcohol Consumption*

891 survey participants answered yes or no when asked whether they consumed alcoholic beverages. 518 yes responses versus 373 no answers were recorded.

#### 4.4.5 *Produce Consumption*

Survey participants were asked about their consumption of home or locally produced fruits, berries and vegetables. 868 responses were recorded. A large majority of 702 respondents replied that at least some portion of their diet consisted of local produce. 99 participants did not consume local produce, and 67 individuals did not know the source of their produce.

874 responses were received indicating whether wild game made up part of the responding individual's normal diet. 539 individuals reported that they consume no game. 333 individuals recorded that game comprised some portion of their routine diet. Two individuals did not know whether they consumed wild game as part of their regular intake of meals.

Radon is a naturally occurring radioactive substance that collects as gas in buildings constructed in localities with certain geologic formations and conditions. Many areas of the United States are prone to radon contamination. Radon is thought to produce effects on human health including being suspected as a lung carcinogen. 129 participants of the Kiski Valley Health study reported that their homes had been checked for the presence of radon gas. A majority 464 had not had their homes screened for radon, while 287 were unsure as to the radon status of their homes. 49 survey participants went on to report that their neighborhoods had been tested for radon. 397 respondents did not believe that their neighborhoods had been monitored for radon, and a majority 419 did not know the status of any radon gas testing in their neighborhoods and communities.

#### 4.5 Additional Comments

The survey form provided blank spacing to allow participants to ask questions, and/or to make comments. All comments that were received by ECO are attached as Appendix C. These comments were edited to delete personal information included such as names and addresses, but are otherwise presented in their entirety.

#### **5.0 ADDITIONAL ACCOMPANYING DATA**

A comprehensive print out of all information recorded from the completed surveys received accompanies this report as Appendix D. Complete surveys for each set of identification numbers are presented with the recorded responses reflected in the order that questions appeared on the survey form. Column headings on the master data base relate exactly to survey question numbering.

## 6.0 CONCLUSIONS AND RECOMMENDATIONS

As noted, this report was expressly prepared for use as a general informational tool by the public. This report is neither written, formatted or intended to be a technical document. However, the completed database that is the result of this initial survey effort provides data which can be utilized to perform a more complete analysis of community health, which relies on traditional epidemiological and risk assessment methodology. This type of in-depth data analysis is suggested.

Additionally, because parameters had to be set that limited the information asked, received and recorded to a manageable database, instances of the occurrence of disease, especially cancers in family members other than Leechburg high graduates or their children are not reflected in the database. Many survey participants included this type of information in the comments section, and follow upon this category of information at some future point may be advisable.

The persistence of anecdotal reports of high incidences of disease attributable to radiation and industrial contamination suggest that house to house health surveys for all communities located in proximity to one or both of the Babcock and Wilcox nuclear fuels processing facilities should be considered.

A future follow-up study of participants in the present study would provide additional useful data on the long term health of a representative sample of residents and former residents of the area.

Finally, we would urge all responsible citizens and former residents of the Kiski Valley area to support the efforts of the Kiski Valley Coalition To Save Our Children in ensuring that both B&W sites, as well as other inactive waste sites in the area are fully documented, monitored and remediated.