

SUBMITTAL CHECKLIST

SITE PLAN REVIEW

Location: 715 Arrowood Ct.

Project Name: Alpha Spectra, Inc.

ITEMS		DISTRIBUTION																	TOTAL REQD.					
DESCRIPTION	SSID REFERENCE	City Community Development	City Dev. Eng.	City Utility Eng.	City Property Agent	City Parks/Recreation	City Fire Department	City Attorney	City Downtown Dev. Auth.	County Planning	County Bldg. Dept.	Irrigation District	Drainage District	Water District	Sewer District - <i>Perisage</i>	U.S. West	Public Service	GVRRP		CDOT	Corps of Engineers	Walker Field	City Environmental Services	Missoula County Health Dept.
● Application Fee	VII-1	1																						
● Submittal Checklist*	VII-3	1																						
● Review Agency Cover Sheet*	VII-3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
● Planning Clearance*	VII-3	1																						
● 11"x17" Reduction of Assessor's Map	VII-1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
● Evidence of Title	VII-2	1		1																				
○ Appraisal of Raw Land	VII-1	1		1	1																			
○ Deeds	VII-1	1		1																				
○ Easements	VII-2	1	1	1	1																			
○ Avigation Easement	VII-1	1		1																				
○ ROW	VII-3	1	1	1	1																			
○ Improvements Agreement/Guarantee	VII-2	1	1	1																				
○ CDOT Access Permit	VII-3	1	1																					
● Industrial Pretreatment Sign-off	VII-4	1	1																					
● General Project Report	X-7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
○ Elevation Drawing	IX-13	1	1																					
● Site Plan - <i>landscaping, parking</i>	IX-29	2	2	1	1																			
○ 11"x17" Reduction of Site Plan	IX-29			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
○ Grading and Drainage Plan	IX-16	1	2																					
○ Storm Drainage Plan and Profile	IX-30	1	2																					
○ Water and Sewer Plan and Profile	IX-34	1	2	1		1																		
○ Roadway Plan and Profile	IX-28	1	2																					
○ Road Cross-Sections	IX-27	1	2																					
○ Detail Sheet	IX-12	1	2																					
● Landscaping Plan	IX-20	2	1	1																				
○ Geotechnical Report	X-8	1	1							1														
○ Final Drainage Report	X-5.6	1	2										1											
○ Stormwater Management Plan	X-14	1	2										1											
○ Phase I and II Environmental Report	X-10,11	1	1																					
○ Traffic Impact Study	X-15	1	2																		1			

NOTES: 1) An asterisk in the item description column indicates that a form is supplied by the City.
 2) Required submittal items and distribution are indicated by filled in circles, some of which may be filled in during the pre-application conference. Additional items or copies may be subsequently requested in the review process.
 3) Each submitted item must be labeled, named, or otherwise identified as described above in the description column.

REVIEW COMMENTS

Page 1 of 2

FILE #136-93

TITLE HEADING: Site Plan Review - Alpha Spectra

LOCATION: 715 Arrowest Court

PETITIONER: Frank Wilkinson

PETITIONER'S ADDRESS/TELEPHONE: 715 Arrowest Court
Grand Junction, CO
243-4477

PETITIONER'S REPRESENTATIVE: Frank Wilkinson

STAFF REPRESENTATIVE: Kathy Portner

NOTE: WRITTEN RESPONSE BY THE PETITIONER TO THE REVIEW COMMENTS IS REQUIRED. A PLANNING CLEARANCE WILL NOT BE ISSUED UNTIL ALL ISSUES HAVE BEEN RESOLVED.

CITY DEVELOPMENT ENGINEER
Gerald Williams

11/15/93
244-1591

No comment.

MESA COUNTY HEALTH DEPARTMENT
Perry L. Buda

11/15/93
248-6966

This source shall be required to submit an Air Pollution Emission Notice (APEN) to the Colorado Department of Health, Air Pollution Control Division as required per Regulation No. 3, Part A.II. of the Colorado Air Quality Control Regulations. Such pollutants to be considered may include lead, acid mists and volatile organic compounds (VOC's). If emission of these or other regulated pollutants are deemed to be less than the minimum reportable amounts, the Division shall respond to the applicant with a letter stating an exemption with any necessary fees to be refunded.

COMMUNITY DEVELOPMENT DEPARTMENT
Kathy Portner

11/18/93
244-1446

1. The interior remodel of the existing building does not require bring the site up to Code in regards to landscaping.
2. The parking requirement is 1 space per employee on the largest shift, plus one space for each vehicle used in operation of the business.
3. All requirements of the Building & Fire Codes must be met, as well as compliance with Health Department and Persigo requirements.

GRAND JUNCTION FIRE DEPARTMENT
George Bennett

11/17/93
244-1400

Fire code requirements will be enforced during the building permit process.

COMMENTS HAVE NOT BEEN RECEIVED FROM THE FOLLOWING REVIEW AGENCIES:

City Utility Engineer
Sewer District (Persigo)
City Environmental Specialist
City Attorney
Mesa County Building Department

BUILDING DEPARTMENT
Bob Lee

11/18/93
244-1656

We have not approved the building for this specific manufacturing use. Portions of the building will be classified as an H occupancy and will have to be separated by fire-walls. Other items will be required based on a plan review of a complete set of plans and specs.

(303) 244-1509

11-3-93

City Planning Department
Grand Junction, Co

136 93

Dear Ms. KATHY PARTNER:

I am sending this information so that you will be able to classify our business that we are setting up at 715 ARROWEST CT. GRAND JCT. 81505. Our phone number at this address is 243-4477.

Alpha Spectra manufactures scintillation detectors. The main component of the detector is a synthetically grown crystal. There are many different types of materials that are grown. We however, at this time are largely working w/ NaI(TL). This is the same material that goes into the "micro-R" meters that you see people walking around town within order to survey the background gamma radiation associated w/ Uranium.

Our manufacturing process consists of machining the crystals into different sizes and shapes. The size and shape is dictated by their intended application. We work on the crystals in a dry (less than 1% RH.) because the crystals hydrate at normal room humidity, i.e. the surface of the crystal melts and this degrades the performance.

The crystals are encapsulated into metal housings and then sealed with wax.

136 93

We will virtually set up to grow the crystals in furnaces. (800°C w/ water jackets for cooling).

We believe that these manufacturing processes are "light manufacturing." Most of the work is comparable to light assembly that occurs at an electronics assembly company.

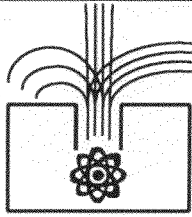
I have included a copy of one of our sales literature pieces. If you need more info please call our Home Jct Office.

Sincerely,

Frank Wilkerson, P. M.S.

President

ALPHA SPECTRA, INC.



**Alpha
Spectra,
Inc.**

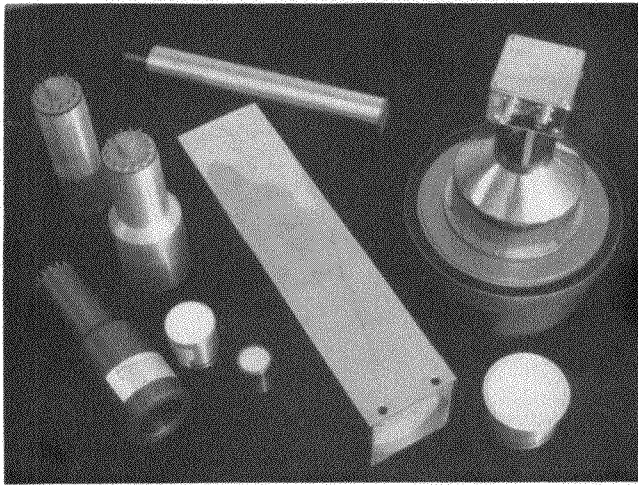
**Scintillation
Detector
Repair
Services**

Introduction

Scintillation detectors are expensive. You have invested a great deal of money in your detectors. When they fail, do not discard them! Put them back to use and save money. Alpha Spectra, Inc.'s scintillation repair laboratory provides both quality repairs and quick turnaround. If you are experiencing problems, give Alpha Spectra, Inc. a call.

Typical Problems

- Poor resolution
- Hydration
- Loss of interface
- Noisy signal
- Intermittent signal
- No signal
- Fractured crystal



Alpha Spectra, Inc. has experience repairing a wide variety of scintillation detectors.

The Answer

Alpha Spectra, Inc.'s scintillation detector laboratory will carefully examine your detector and quote the cost of repair. We will repair the detector quickly. In addition, we can often improve the performance of the detector by utilizing recent technological advancements. Call and ask us for details on how to ship a detector safely.

The Result

Savings and a Guarantee

You save both time and money when you repair your detectors. After a repair, our laboratory provides a two year warranty against defects due to poor workmanship.

Experience

The scintillation detector repair team at Alpha Spectra, Inc. has a wide range of experience. Types of units repaired include:

- 8" x 4" NaI(Tl) detectors
- 4" x 4" x 16" NaI(Tl) detectors
- 3" x 3" NaI(Tl) detectors
- 3" x 3" NaI(Tl) well detectors
- 5" x 1" NaI(Tl) detectors
- F.I.D.L.E.R. probes
- 2" x 12" CsI(Na) detectors
- Other detectors.

About Our Company

Alpha Spectra, Inc. was founded in 1986. Our company is owned and operated by a nuclear physicist with over fifteen years experience in nuclear radiation measurements. Our professional staff is prepared to answer your questions about the design and repair of scintillation detectors.

Product Line

Alpha Spectra, Inc. also supplies new scintillation detectors. Please call us for more information about available sizes and geometries. If you have a prototype application, we will be glad to assist you in the design process.

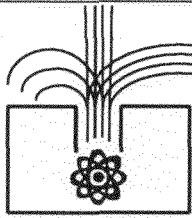
**Alpha
Spectra,
Inc.**

- **Scintillation Detector Laboratory**
- **Radon Analysis Laboratory**
- **Health Physics Consulting**

Your Area Representative is:

Alpha Spectra, Inc.

1315 Nelson Street, Unit #8
Lakewood, Colorado 80215
1-800-231-2545
303-232-2545
fax 303-232-2683

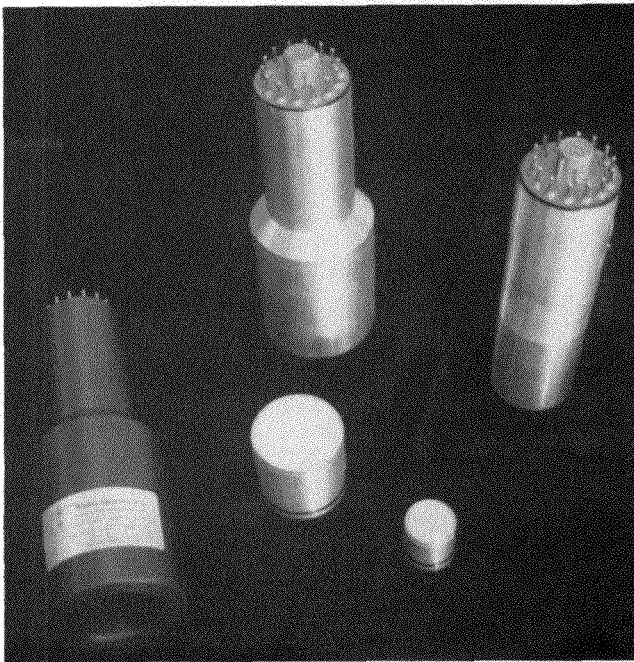


**Alpha
Spectra,
Inc.**

Scintillation Detector Product Line

Introduction

Alpha Spectra, Inc.'s scintillation detector team has over fifteen years experience working with scintillation crystals. Working experience includes both large and small units. Detector applications include high energy physics, nuclear medicine, geophysical applications (well logging and aerial surveys), waste monitoring, health physics, academic research, and routine gamma survey equipment.



Typical scintillation detectors available from Alpha Spectra, Inc.

NaI(Tl) Product Line

All of Alpha Spectra, Inc.'s scintillation crystals are assembled in our laboratory located just outside of Denver, Colorado. We purchase high quality blanks from crystal growers and we machine the crystals to your specifications. The detectors are assembled in a humidity controlled environment due to the hygroscopic nature of NaI(Tl) crystals. Available detectors include:

- Standard cylinders
- Standard rectangles
- Well detectors
- Thin entrance window detectors
- Mounted or demountable PMTs

Design and Assembly

Our scintillation detector services include both design and assembly of new units. If you have a unique application, we can assist with the design so that you will be assured that the performance is optimized.

About Our Company

Alpha Spectra, Inc. was founded in 1986. Our company is owned and operated by a nuclear physicist with over fifteen years experience in nuclear radiation measurements. Our professional staff is prepared to answer your questions about the design and repair of scintillation detectors.

Guarantee

Alpha Spectra, Inc. will repair or replace at no charge to our customer any detector that fails due to failure of hermetic seal, poor workmanship, or defective materials. This guarantee is extended for two years from the date of shipment from Alpha Spectra, Inc. The photomultiplier tube manufacturers' warranties are extended from the date of shipment from Alpha Spectra, Inc.

Repair Services

Alpha Spectra, Inc. will carefully examine your defective detector and quote the cost of repair. Call and ask us about this service.

**Alpha
Spectra,
Inc.**

- Scintillation Detector Laboratory
- Radon Analysis Laboratory
- Health Physics Consulting

Your Area Representative is:

Alpha Spectra, Inc.

1315 Nelson Street, Unit #8
Lakewood, Colorado 80215
1-800-231-2545
303-232-2545
fax 303-232-2683

Manufacturing Process Discussion

Alpha Spectra's crystal manufacturing operations can be divided into three separate major groups: crystal growth, crystal cutting and assembly, and final detector test. There are also other support operations such as design, research and development and customer service. To date Alpha Spectra has not grown crystals, all material that has been used to manufacture detectors has come from other sources.

There are three main components to the scintillation detectors that we manufacture:

- the NaI(Tl) crystal
- the machined hardware
- the photomultiplier tube.

Crystal Growth: The chemicals materials that are used to grow the NaI(Tl) crystals are NaI and TlI. The NaI and TlI are loaded into the furnace along with previously grown material that is being recycled. The crystal growth process is started by loading a crucible into an electrically resistive furnace. The furnace is then prepared for the one month growth cycle by pumping down the furnace with vacuum pumps.

After the furnace is completely evacuated, the temperature is brought up to approximately 750 degrees centigrade so that the salt becomes a molten liquid. The furnace is designed in such a way that the outer surface can be touched during the growth process.

At the end of the growth process the furnace is pumped down again to remove noxious fumes. These fumes are trapped in either a cold trap or charcoal filter system. The furnace is then opened up while the ingot is still hot. The ingot is then transferred to the annealer. The ingot is then annealed for about three weeks at 300 to 400 degrees centigrade.

After the annealing process is completed the crystal can then be sawn or machined. The machining process is not much different than machining that would be done to a piece of plastic or metal.

Once a piece of NaI(Tl) is machined it is then ready to be housed in a hermetically sealed container. The container provides a moisture barrier so that the crystal will not hydrate.

Since the NaI(Tl) material is very sensitive to moisture the assembly process must take place in a dry environment. We will construct a dry room to facilitate this need. All work that is done on the crystal before it is hermetically sealed with epoxies will be done in the dry room area.

Once assembly is completed the detector is tested to verify that it meets customer specifications before shipment.

Waste Generation

Alpha Spectra's process waste stream beyond the typical wastes that are generated by any business (e.g. paper products) is as follows:

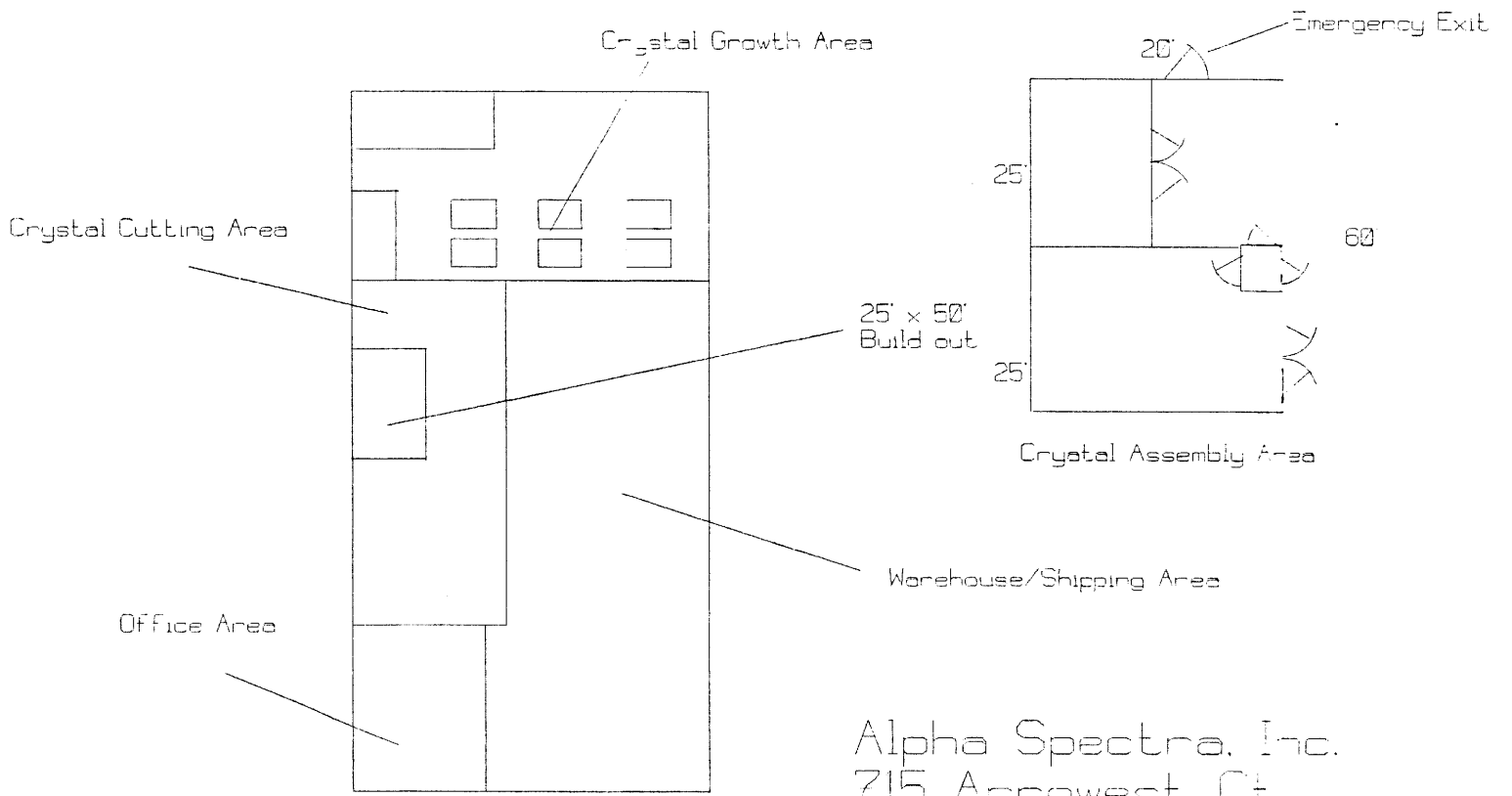
Solids/Liquids

1. NaI(Tl) sludge generated in the machining process.
2. Excess epoxies (<100 g/day), silicones (<100 g/day), aluminum oxide (<100 g/day), magnesium oxide (<100 g/month), titanium oxide (<100 g/month), hydrochloric acid - neutralized (5 liters/month).

We have been storing all sludge that has been generated to this date in time. During storage the oil and NaI(Tl) separate so that the oil can be reused during the cutting and machining processes. The remaining sludge (approx. 25-50 kg/month) will be returned to the vendor for reprocessing.

The remainder of the solids and liquids will be sent to a sanitary landfill unless local requirements dictate otherwise.

Tenant Improvement
B102693A



10/26/93 FW

Alpha Spectra, Inc.
715 Arrowest Ct.
Grand Junction, CO 81505
(303) 243-4477

Alpha Spectra, Inc.
715 Arrowest Ct.
Grand Junction, CO 81505
(303) 243-4477

November 7, 1993

City of Grand Junction Fire Dept.
Attn: Mr. George Bennett
330 South 6th Street
Grand Junction, CO 81501

Dear Sir:

This information is being provided in order that Alpha Spectra, Inc. will be provided the necessary permits to operate its manufacturing facility at 715 Arrowest Ct., Grand Junction, Colorado. As I have explained to you in a previous conversation Alpha Spectra has already moved into the facility. The building department has approved the building for use as a manufacturing facility as we propose contingent upon your approval. The information provided here should assist your department in evaluating the processes that are involved in our manufacturing.

Specifically the following information is provided for your review:

- 1. Product Description:** The radiation detectors that we manufacture are used in many different applications. A brief description is given regarding the different uses.
- 2. Manufacturing Process:** A narrative is given that explains what steps are involved in the production of the crystals that are used as radiation detectors. When possible, photos are used to demonstrate these steps.
- 3. Material Safety Data Sheets:** We have provided for your reference our set of material safety data sheets. As this is our only set we will want to have these documents returned as soon as possible. In addition, we have tabulated the current use and projected use based on anticipated growth over the next two years.

I would personally like to reassure you that Alpha Spectra, Inc. desires to comply with all pertinent regulations.

Product Description: The radiation detectors that Alpha Spectra, Inc. manufactures consist of NaI(Tl), CsI(Na), or BGO crystals. These crystalline materials have the property that when incident radiation strikes them they give off low level amounts of light. This light is measured by photosensitive devices. The associated electronics used is capable of determining the energy and the amount of radiation that struck the crystal.

These detectors are used in nuclear medicine departments in hospitals, nuclear power plants, hand held survey instruments, oil exploration, research done in outer space, by the defense department, and in academic research.

Manufacturing Process: The manufacture of crystals used in radiation measurements starts with the growth of the crystal. The crystals are grown in electrical furnaces that approach 750 degrees C. The growth material is placed in a crucible and heated to temperatures above the melting point of the salt. Typically the growth cycle lasts about one month. After the growth cycle, the ingot is transferred to an annealing furnace. The annealing process removes both mechanical and thermal stresses in the crystalline ingot by cycling the temperature around 300 degrees C. The process is completed in three weeks.

Each furnace is equipped with a refractory that is surrounded by a stainless steel housing and contains a water jacket that is kept near room temperature.

After the crystal ingot is grown, it is cut, machined and packaged according to customer specifications. The packaging process must be done in a very dry environment (less than 1% R.H.) since the crystal material is hygroscopic. (This means that the material has a high affinity for moisture, in the same way that a desiccant takes on moisture.)

Alpha Spectra's main competitor is located in Newbury, Ohio, near Cleveland. The company is called Bicron Corporation.

A drawing showing the proposed plant layout is attached.

Material Safety Data Sheets: The accompanying book contains the MSD sheets for the materials that we are currently using. Tabulated below are the approximate amounts that we currently have in use.

Material

Amount

Calcined alumina	5 lbs.
Aluminum oxide	50 lbs. - EPA reportable
Silicone compounds	50 lbs.
Reagent alcohol, absolute	2 gals.
Optical coupling compound	1 qt.
Titanium dioxide	5 lbs.
Epoxies - Grace	2 gals.
Calcined magnesia	75 lbs.
Acetone	2 gals.
Hydrocarbons > 410 deg. F flash point	10 gals.
Lead	1500 lbs.
NaI(Tl)	8,000 lbs. (approx.) - very hazardous when heated - emits hazardous gas - will be contained

If there is any other information that I can provide to assist you in this process please do not hesitate to call me at 243-4477.

Sincerely,



Frank Wilkinson III, M.S.
President
Alpha Spectra, Inc.

Attachments

COMMUNITY DEVELOPMENT DEPARTMENT

MEMORANDUM

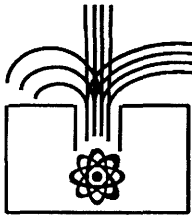
TO: Review Agencies

FROM: Kathy Portner, Community Development Department *KP*

DATE: November 10, 1993

RE: Attached Development Proposal

Alpha Spectra, Inc. is proposing to occupy an existing building located at 715 Arrowest Ct. which is in an industrial subdivision recently annexed into the City. The zoning is I-1, light industrial. The existing site around the building is in asphalt or concrete surface. The only modifications to the site proposed are interior modifications to the existing building. Because of the unique nature of the business and the processes they use we are requesting a higher level of review than would normally be required for an interior remodel. Please review the proposal and comment on any requirements your agency might have for this type of industry. We do not have a use category in our Use/Zone Matrix that fits this proposal and are looking for guidance from the review agencies as to whether you would consider this a light industrial use or a heavy industrial use.



Alpha Spectra, Inc.
SCINTILLATION DETECTORS

(800) 231-2543
(303) 243-4477
Fax (303) 244-6947

Frank Wilkinson III, M.S.
Nuclear Physicist
President

715 Arrowest Court
Grand Junction, CO 81505

November 19, 1993

City of Grand Junction, Colorado
Attn: Ms. Kathy Portner
Department of Community Development
250 North Fifth Street
Grand Junction, CO 81501

Dear Ms. Portner:

This letter is being sent in response to your fax of November 18 regarding file #136-93, Alpha Spectra Inc. building improvement proposal. I would like to thank you for giving your immediate attention to these matters over the past few days. I would like to reassure you that my company wants to satisfy all regulatory concerns.

The following comments are in response to your fax.

Mesa County Health Dept. and Colorado Department of Health Offices (Scott Miller): I have contacted Mr. Miller several times over the past few months. He advises us that we will have to file for an emissions permit. Based on the information that we have exchanged over the phone we may not have to have a permit.

Community Development Department: Alpha Spectra currently will employ about four or five employees here in Grand Junction. There is adequate space for parking for this many employees.

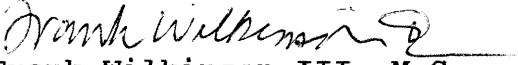
Persigo Sewer District: Mr. Dan Tonello visited our facility this morning and he has stated that since we are recycling our process waste he has no immediate concerns. We also talked about what effluent we will have when the growth operation is operating. He stated that we should contact his office again in about April once the project is nearer to completion. He stated that if we neutralize the small amounts of acids that we will be using there should be no problems.

Grand Junction Fire Department: We will be working with Mr. George Bennett of the Fire Dept. to ensure that all fire codes

are addressed.

Once again thank you for your immediate attention to these matters.

Sincerely,


Frank Wilkinson III, M.S.
President
Alpha Spectra, Inc.

To: Kathy Portner
From: Dan Tonello
Subject: Alpha Spectra Inc.
Date: 11/19/93 Time: 12:10p

Dear Kathy

As a result of the Industrial Inspection performed at Alpha Spectra on 11/19/93, it is this departments determination that this industry does not need an Industrial Discharge Permit. This industry will not be discharging any waste flow other than domestic.

Mr. Wilkinson was informed that he will be required to contact this office in regard to any major process changes.