

From: "Stephen Gravina" <Stephen.Gravina@Linguagen.com>
To: "Judith Joustra" <jaj@nrc.gov>
Date: Mon, Mar 3, 2003 1:00 PM
Subject: RE: FW: Linguagen Corp

Judith:

Question: Do you know the total volume of water released to the sewer that month?

Answer: Yes. We ran the water at 4 Liter/min for 96 hours (4 days X 24 hours). This value was calculated from the table below. Our MPC as stated in our license for H-3 is $1e-2$ uCi/ml. We disposed of 21,603 uci.

Thus $21,603 \text{ uci} / X \text{ ml} / 1e-2 \text{ uci/ml} = 21,603,000 \text{ ml}$ or 21,603 liters. We ran the water at 240 liters/hour X 96 hours = 23,040 liters.

Question: I need to confirm that you did not exceed the maximum allow concentration of H-3 per month listed in table 3 of appendix B located in 10 CFR Part 20. Part 20 does allow a total of 5 curies of H-3 to be disposed to the sewer per year.

Answer: Our calculated limit per month is 152.9 mCi/month, we disposed of ~22 mCi in the month of February. Thus, we were within our limits.

Here is an excerpt from our License Application concerning disposal limits and water flow:

Liquid radioactive waste may be disposed of in a sink or drain leading to the sewer if it is readily soluble material or readily dispersible biological material. This procedure will be within the regulations of 10 CFR 20.2003 as demonstrated by the following sample calculations.

The quantity of water will be estimated by running the sink faucet at a measured flow rate for a known time. For example, 3 gallons per minute for 3 hours is equal to 15,289,020 ml.

Using this sewer flow rate and the sewer disposal limits specified in 10 CFR 20.2003(a), the limits for allowable quantities which may be disposed of into the sewer per month are calculated as follows:

$$A_{\text{max}} = \text{MPC} \times V$$

where,

A_{max} = monthly sewer release limit, uCi

MPC = Monthly Sewer Concentration Limit, Table 3, Appendix B to Part 20,

uCi/ml

V = volume of water put in sewer per month, ml

Sample Calculation of Monthly Sewer Release Limits for a Particular Sewer Flow Rate

Radionuclide Monthly Sewer Concentration Limit Table 3, (Appendix B, 20.1001-2401) Calculated Monthly Sewer Release Limit

	uCi/ml	mCi/month
Hydrogen-3	1.00e-02	152.9
Carbon-14	3.00e-04	4.6
Phosphorus-32	9.00e-05	1.4
Phosphorus-33	8.00e-04	12.2
Sulfur-35	1.00e-03	15.3

Question: This H-3 must also be readily soluble and readily dispersible biological material in water.

The compound was a water soluble artificial sweetener.

Question: From your disposal log and your pervious email it looks like the H-3 was never used. Correct, the compound was never used. It was stored in a -20 freezer that became disabled over a weekend. It was decided that the compound could have degraded over that time and that it should be disposed of.

-----Original Message-----

From: Judith Joustra [mailto:jaj@nrc.gov]

Sent: Monday, March 03, 2003 8:37 AM

To: Stephen.Gravina@Linguagen.com

Subject: RE: FW: Linguagen Corp

I received your disposal records for the H-3 and P-32. It appears that you disposed of the H-3 via the sewer and you indicate that you disposed of 21.6025 mci of H-3 during the month of February 2001. Do you know the total volume of water released to the sewer that month?

I need to confirm that you did not exceed the maximum allow concentration of H-3 per month listed in table 3 of appendix B located in 10 CFR Part 20. Part 20 does allow a total of 5 curies of H-3 to be disposed to the sewer per yea. This H-3 must also be readily soluble and readily dispersible biological material in water. From your disposal log and your pervious

email it looks like the H-3 was never used.

>>> "Stephen Gravina" <Stephen.Gravina@Linguagen.com> 02/26/03 03:15PM >>>
Judith:

Yes we have the disposal records for the H-3 and P-32. I will need to FAX this information. Could you please email me your FAX number?

-----Original Message-----

From: Judith Joustra [mailto:JAJ@nrc.gov]

Sent: Wednesday, February 26, 2003 9:36 AM
To: Stephen.Gravina@Linguagen.com
Subject: RE: FW: Linguagen Corp

Did you retain a copy of disposal records for the H-3 and P-32? If so could you fax copies to me? If the P-32 decayed 10 half lives it could have been disposed as non-radioactive waste if survey results indicated that it did not exceed background. The H-3 should have been disposed as radioactive waste.

>>> "Stephen Gravina" <Stephen.Gravina@Linguagen.com> 02/26/03 09:04AM >>>
Judith:

I have reviewed our records and can reconcile the inconsistencies you have noted below.

1. Concerning P32 use at Linguagen's 215 College Road laboratories.

Linguagen moved from Givaudan Roure in Clifton, New Jersey to Hoffmann La-Roche in Nutley, New Jersey in 1998. We had not used radioactive materials in Clifton but did utilize radioactive materials at Roche and were regulated by Roche's RSC. At that time we had employees that utilized P-32. Around March of 2000 we moved to 215 College Road in Paramus and initiated our own program, which was licensed by the NRC and started to use radioactive materials in May of 2000. My recollection was that the employees that used P-32 moved on before we occupied 215 College road and when I reviewed our records I missed the fact that one employee worked with us for a short period of time and did use limited amounts of P-32.

Our records show that 250 microcuries of P-32 was received on 9/12/00 and 10/6/00. The last time P-32 was utilized at Linguagen (215 College Road) was on 11/1/00. I have estimated that by December 31, 2000 the isotope had

decayed to approximately 4 microcuries. The P-32 was allowed to decay further and was disposed of as required. I apologize for the confusion and my omission of this important information. It was my error and I take full responsibility.

2. Concerning the 20 mCi of H-3 noted in our 2000 inspection. We received ~20 mCi of an H-3 labeled compound in a sealed vial in August of 2000. This sample was stored but never utilized. It was disposed of appropriately in February of 2001 in accordance with our license.

Thus, I must qualify my previous statement to:

Linguagen has only utilized radioactive materials containing sulfur 35 since February of 2001. No other radionuclides have been used on site since that time. Linguagen has previously had P-32 and H-3 containing materials, but has not had P-33 or C-14 containing nucleotides.

Stephen Gravina Ph.D.
Associate Director

-----Original Message-----

From: Judith Joustra [mailto:JAJ@nrc.gov]
Sent: Monday, February 24, 2003 11:32 AM
To: Stephen.Gravina@Linguagen.com
Subject: Re: FW: Linguagen Corp

I was reviewing your NRC file and documentation from an inspection conducted in 2000 indicates that Linguagen possess a total of 150 microcuries of P-32, 1.3 mci of S-35 and 20 mci of H-3. This appears to conflict with your response to item 1. of your email. Please clarify.

>>> "Stephen Gravina" <Stephen.Gravina@Linguagen.com> 02/24/03 11:20AM >>>

Judy:

Here are statements to questions from our conversation of Feb 24, 2003.

1. What other nucleotides beside sulfur 35 were utilized at Linguagen.
Linguagen only utilized radioactive materials containing sulfur 35. No other radionuclides were used on site.

2. What was the average amount of radionucleotides on hand at Linguagen at any one time.

1 mCi S35

3. Were any radioactive materials moved from the Paramus facility to the Cranbury facility.

No. All contaminated glass and plastic materials were disposed of before the move.

4. Who is Michael Drzyzga and what is his address.

Michael Drzyzga is the RSO of Hoffmann - La Roche Inc. in Nutley, NJ 07110

His address is:

Consulting in Health Physics
37 Pecan Lane
Oak Ridge, NJ 07438

Sincerely,

Stephen Gravina Ph.D.
Associate Director

-----Original Message-----

From: Stephen Gravina [mailto:Stephen.Gravina@Linguagen.com]

Sent: Wednesday, February 12, 2003 10:11 AM

To: jaj@nrc.gov

Subject: Linguagen Corp

Judy:

Our records indicate that the last use of radioactive materials used at 215 College Rd Suite 310 Paramus, NJ 07652 was on December 4, 2002.

Faxing the manifests you requested was problematic. I have sent full size copies via 2nd day Fed Ex tracking number 8389 5809 2316. If you require any other information please call.

Sincerely,

Stephen Gravina Ph.D.
Associate Director

Linguagen Corp

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