

August 12, 2022

U.S. Securities and Exchange Commission
Division of Corporation Finance
100 F Street, N.E.
Washington, D.C. 20549

Attention: Ibolya Ignat
Kevin Kuhar
Conlon Danberg
Christopher Edwards

**Re: ASP Isotopes Inc.
Amended Draft Registration Statement on Form S-1
CIK No. 0001921865
Submitted June 27, 2022**

Ladies and Gentlemen:

This letter is confidentially submitted on behalf of ASP Isotopes Inc. (the "**Company**") in response to comments of the staff (the "**Staff**") of the U.S. Securities and Exchange Commission (the "**Commission**") with respect to the Company's Amended Draft Registration Statement on Form S-1 confidentially submitted on June 27, 2022 (the "**Draft Registration Statement**"), as set forth in the Staff's letter dated July 12, 2022 (the "**Comment Letter**").

Set forth below are the Company's responses to the Staff's comments in the Comment Letter. For reference purposes, the text of the Staff's comments are reproduced **in bold** below, followed by the Company's response to the comment. The numbered paragraphs below correspond to the numbered comments in the Comment Letter.

Additionally, the Company is concurrently confidentially submitting Amendment No. 3 to the Draft Registration Statement ("**Amendment No. 3**"), which reflects revisions in response to the Comment Letter and certain other updates.

Amended Draft Registration Statement on Form S-1, submitted on June 27, 2022

Risk Related to Regulatory Compliance

Our business is and could become subject to a wide variety of extensive and evolving laws and regulations. Failure to comply with such.... page 15

- We note your revised disclosure in response to previous comment 6 and re-issue the comment in part. Please expand your disclosure to briefly explain the material licenses, approvals and permits you or Klydon have received in connection with the construction or operation of the Mo-100 enrichment facility in South Africa. In addition, please specify the conditions that are associated with such licenses, approvals and permits and, if material, discuss the risks that could cause such conditions to not be maintained.**

Company Response: The Company acknowledges the Staff's comment and respectfully advises the Staff that it has revised the disclosure on page 17 of Amendment No. 3 to include enhanced disclosure regarding the registration certificates and Manufacturing and Services Permits issued to ASP Isotopes South Africa (Proprietary) Limited and Klydon by the South African Council for The Non-Proliferation of Weapons of Mass Destruction.

Use of Proceeds, page 42

- Please disclose the approximate amount intended to be used to initiate and fully fund Phase 2 of the Mo-100 development plan under the turnkey contract.**

Company Response: The Company respectfully acknowledges the Staff's comment and has revised its disclosures on pages 5 and 42 of Amendment No. 3 to clarify that the Company currently estimates approximately \$6 million of the total net proceeds will be needed to initiate and fully fund Phase 2 of the Mo-100 development plan under the turnkey contract.

Letter of Intent for Klydon Shares or Assets, page 49

- We note your revised disclosure in response to previous comment 12 and re-issue the comment in part. We refer to your disclosure that you "do not expect the timing or success of the Klydon acquisition to have a material effect on either our business or our financial results in the future because of the existing commercial agreements (including exclusive licenses) that we have with Klydon." Please expand on this disclosure to explain why your existing commercial agreements with Klydon would prevent the acquisition of Klydon from having a material effect on your business. In this regard, we note your statement on page 25 that you are "substantially dependent on the Turnkey Contract for the operation of [y]our company" because you do not yet have sufficient internal capabilities to perform the functions Klydon is providing under such agreement. Please discuss any material risks that would be associated with having to directly develop, manage and/or finance the services Klydon is providing under the existing commercial agreements in the event that you were to acquire Klydon.**

Company Response: The Company respectfully acknowledges the Staff's comment and has revised its disclosures on pages 50 and 92 of Amendment No. 3 to enhance the disclosure regarding our expectation regarding the future operation of the Mo-100 enrichment plant, assuming it is successfully commissioned.

Continue identifying potential offtake customers and strategic partners for Mo-100, page 59

- We note your response to previous comment 18 regarding the name of the strategic advisor in China. Please expand on your disclosure to explain that you expect to enter into similar consulting and sales commission agreements with other individuals and entities in the future in the ordinary course of business.**

Company Response: The Company respectfully acknowledges the Staff's comment and has revised its disclosures on page 61 of Amendment No. 3.

Indemnification Arrangements with Drs Ronander and Strydom, page 90

- We note your revised disclosure in response to previous comment 24 and re-issue the comment in part. Please describe any agreements that a third party entered into with Dr Einar, Dr Strydom, Klydon, and Isotope Separation Technology (Pty) Ltd. that would be covered by this indemnification agreement. Additionally, please disclose whether you are aware of any instituted or threatened claim, litigation or controversy which could be covered by the indemnification agreement. Finally, please disclose whether Klydon, Isotope Separation Technology (Pty) Ltd, or any other third party is providing indemnity against these claims as well.**

Company Response: The Company respectfully acknowledges the Staff's comment and has revised its disclosures on page 93 of Amendment No. 3.

Advisor Agreement with ChemBridges LLC, page 91

6. We note your revised disclosure in response to previous comment 34. Please revise your description of the Advisor Agreement with ChemBridges LLC to describe the termination provisions of such agreement.

Company Response: The Company respectfully acknowledges the Staff's comment and has revised its disclosures on pages 93 and 94 of Amendment No. 3.

[Remainder of page intentionally blank. Signature page follows.]

2

Should the Staff have additional questions or comments regarding this submission, please do not hesitate to contact the undersigned at (858) 677-1470 or donald.ainscow@us.dlapiper.com.

Sincerely,

/s/ Donald G. Ainscow

Donald G. Ainscow
DLA Piper LLP (US)

Enclosures:

cc: Paul Mann, Chairman, Chief Executive Officer and Chief Financial Officer
ASP Isotopes Inc.

3