

Form 5500 Department of the Treasury Internal Revenue Service Department of Labor Employee Benefits Security Administration Pension Benefit Guaranty Corporation	Annual Return/Report of Employee Benefit Plan This form is required to be filed for employee benefit plans under sections 104 and 4065 of the Employee Retirement Income Security Act of 1974 (ERISA) and sections 6057(b) and 6058(a) of the Internal Revenue Code (the Code). ▶ Complete all entries in accordance with the instructions to the Form 5500.	OMB Nos. 1210-0110 1210-0089 2022 This Form is Open to Public Inspection
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Part I	Annual Report Identification Information
For calendar plan year 2022 or fiscal plan year beginning <u>01/01/2022</u> and ending <u>12/31/2022</u>	
A This return/report is for:	☐ a multiemployer plan ☐ a multiple-employer plan (Filers checking this box must attach a list of participating employer information in accordance with the form instructions.) ☒ a single-employer plan ☐ a DFE (specify) ____
B This return/report is:	☐ the first return/report ☐ the final return/report ☒ an amended return/report ☐ a short plan year return/report (less than 12 months)
C If the plan is a collectively-bargained plan, check here.	☐
D Check box if filing under:	☒ Form 5558 ☐ automatic extension ☐ the DFVC program ☐ special extension (enter description)
E If this is a retroactively adopted plan permitted by SECURE Act section 201, check here.	☐

Part II Basic Plan Information —enter all requested information		
1a Name of plan <u>ARROWSTREET CAPITAL L.P. 401(K) PLAN</u>	1b Three-digit plan number (PN) ▶	<u>001</u>
2a Plan sponsor's name (employer, if for a single-employer plan) Mailing address (include room, apt., suite no. and street, or P.O. Box) City or town, state or province, country, and ZIP or foreign postal code (if foreign, see instructions) <u>ARROWSTREET CAPITAL L.P.</u> <u>200 CLARENDON ST. 30TH FLOOR</u> <u>BOSTON, MA 02116</u>		
1c Effective date of plan <u>02/01/2004</u>		
2b Employer Identification Number (EIN) <u>04-3472863</u>		
2c Plan Sponsor's telephone number <u>617-919-0000</u>		
2d Business code (see instructions) <u>523900</u>		

Caution: A penalty for the late or incomplete filing of this return/report will be assessed unless reasonable cause is established.

Under penalties of perjury and other penalties set forth in the instructions, I declare that I have examined this return/report, including accompanying schedules, statements and attachments, as well as the electronic version of this return/report, and to the best of my knowledge and belief, it is true, correct, and complete.

SIGN HERE	Filed with authorized/valid electronic signature.	10/13/2023	CARA HUME
	Signature of plan administrator	Date	Enter name of individual signing as plan administrator
SIGN HERE			
	Signature of employer/plan sponsor	Date	Enter name of individual signing as employer or plan sponsor
SIGN HERE			
	Signature of DFE	Date	Enter name of individual signing as DFE

For Paperwork Reduction Act Notice, see the Instructions for Form 5500.

Form 5500 (2022)
v. 220413

3a Plan administrator's name and address ☒ Same as Plan Sponsor		3b Administrator's EIN 3c Administrator's telephone number
4 If the name and/or EIN of the plan sponsor or the plan name has changed since the last return/report filed for this plan, enter the plan sponsor's name, EIN, the plan name and the plan number from the last return/report: a Sponsor's name c Plan Name		4b EIN 4d PN
5 Total number of participants at the beginning of the plan year		5 492
6 Number of participants as of the end of the plan year unless otherwise stated (welfare plans complete only lines 6a(1) , 6a(2) , 6b , 6c , and 6d). a(1) Total number of active participants at the beginning of the plan year a(2) Total number of active participants at the end of the plan year b Retired or separated participants receiving benefits c Other retired or separated participants entitled to future benefits..... d Subtotal. Add lines 6a(2) , 6b , and 6c e Deceased participants whose beneficiaries are receiving or are entitled to receive benefits. f Total. Add lines 6d and 6e g Number of participants with account balances as of the end of the plan year (only defined contribution plans complete this item)..... h Number of participants who terminated employment during the plan year with accrued benefits that were less than 100% vested.....		 6a(1) 351 6a(2) 393 6b 0 6c 171 6d 564 6e 0 6f 564 6g 544 6h 0
7 Enter the total number of employers obligated to contribute to the plan (only multiemployer plans complete this item)		7
8a If the plan provides pension benefits, enter the applicable pension feature codes from the List of Plan Characteristics Codes in the instructions: 2E 2F 2G 2J 2K 2T 3B 3D b If the plan provides welfare benefits, enter the applicable welfare feature codes from the List of Plan Characteristics Codes in the instructions:		
9a Plan funding arrangement (check all that apply) (1) ☐ Insurance (2) ☐ Code section 412(e)(3) insurance contracts (3) ☒ Trust (4) ☐ General assets of the sponsor	9b Plan benefit arrangement (check all that apply) (1) ☐ Insurance (2) ☐ Code section 412(e)(3) insurance contracts (3) ☒ Trust (4) ☐ General assets of the sponsor	
10 Check all applicable boxes in 10a and 10b to indicate which schedules are attached, and, where indicated, enter the number attached. (See instructions)		
a Pension Schedules (1) ☒ R (Retirement Plan Information) (2) ☐ MB (Multiemployer Defined Benefit Plan and Certain Money Purchase Plan Actuarial Information) - signed by the plan actuary (3) ☐ SB (Single-Employer Defined Benefit Plan Actuarial Information) - signed by the plan actuary	b General Schedules (1) ☒ H (Financial Information) (2) ☐ I (Financial Information – Small Plan) (3) ☐ 0 A (Insurance Information) (4) ☒ C (Service Provider Information) (5) ☒ D (DFE/Participating Plan Information) (6) ☐ G (Financial Transaction Schedules)	

Part III Form M-1 Compliance Information (to be completed by welfare benefit plans)

11a If the plan provides welfare benefits, was the plan subject to the Form M-1 filing requirements during the plan year? (See instructions and 29 CFR 2520.101-2.) ☐ Yes ☐ No

If "Yes" is checked, complete lines 11b and 11c.

11b Is the plan currently in compliance with the Form M-1 filing requirements? (See instructions and 29 CFR 2520.101-2.) ☐ Yes ☐ No

11c Enter the Receipt Confirmation Code for the 2022 Form M-1 annual report. If the plan was not required to file the 2022 Form M-1 annual report, enter the Receipt Confirmation Code for the most recent Form M-1 that was required to be filed under the Form M-1 filing requirements. (Failure to enter a valid Receipt Confirmation Code will subject the Form 5500 filing to rejection as incomplete.)

Receipt Confirmation Code _____

SCHEDULE C (Form 5500) Department of the Treasury Internal Revenue Service Department of Labor Employee Benefits Security Administration Pension Benefit Guaranty Corporation	Service Provider Information This schedule is required to be filed under section 104 of the Employee Retirement Income Security Act of 1974 (ERISA). ▶ File as an attachment to Form 5500.	OMB No. 1210-0110
		2022
		This Form is Open to Public Inspection.

For calendar plan year 2022 or fiscal plan year beginning 01/01/2022 and ending 12/31/2022		
A Name of plan ARROWSTREET CAPITAL L.P. 401(K) PLAN	B Three-digit plan number (PN) ▶	001
C Plan sponsor's name as shown on line 2a of Form 5500 ARROWSTREET CAPITAL L.P.	D Employer Identification Number (EIN) 04-3472863	

Part I	Service Provider Information (see instructions)
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You must complete this Part, in accordance with the instructions, to report the information required for **each person** who received, directly or indirectly, \$5,000 or more in total compensation (i.e., money or anything else of monetary value) in connection with services rendered to the plan or the person's position with the plan during the plan year. If a person received **only** eligible indirect compensation for which the plan received the required disclosures, you are required to answer line 1 but are not required to include that person when completing the remainder of this Part.

1 Information on Persons Receiving Only Eligible Indirect Compensation

- a Check "Yes" or "No" to indicate whether you are excluding a person from the remainder of this Part because they received only eligible indirect compensation for which the plan received the required disclosures (see instructions for definitions and conditions)..... ☒ Yes ☐ No
- b If you answered line 1a "Yes," enter the name and EIN or address of each person providing the required disclosures for the service providers who received only eligible indirect compensation. Complete as many entries as needed (see instructions).

(b) Enter name and EIN or address of person who provided you disclosures on eligible indirect compensation
FIDELITY INVESTMENTS INSTITUTIONAL
04-2647786

(b) Enter name and EIN or address of person who provided you disclosures on eligible indirect compensation
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2. Information on Other Service Providers Receiving Direct or Indirect Compensation. Except for those persons for whom you answered "Yes" to line 1a above, complete as many entries as needed to list each person receiving, directly or indirectly, \$5,000 or more in total compensation (i.e., money or anything else of value) in connection with services rendered to the plan or their position with the plan during the plan year. (See instructions).

(a) Enter name and EIN or address (see instructions)

FIDELITY INVESTMENTS INSTITUTIONAL

04-2647786

(b) Service Code(s)	(c) Relationship to employer, employee organization, or person known to be a party-in-interest	(d) Enter direct compensation paid by the plan. If none, enter -0-.	(e) Did service provider receive indirect compensation? (sources other than plan or plan sponsor)	(f) Did indirect compensation include eligible indirect compensation, for which the plan received the required disclosures?	(g) Enter total indirect compensation received by service provider excluding eligible indirect compensation for which you answered "Yes" to element (f). If none, enter -0-.	(h) Did the service provider give you a formula instead of an amount or estimated amount?
37 60 64 65	RECORDKEEPER	-7900	Yes ☒ No ☐	Yes ☒ No ☐	0	Yes ☒ No ☐

(a) Enter name and EIN or address (see instructions)

(b) Service Code(s)	(c) Relationship to employer, employee organization, or person known to be a party-in-interest	(d) Enter direct compensation paid by the plan. If none, enter -0-.	(e) Did service provider receive indirect compensation? (sources other than plan or plan sponsor)	(f) Did indirect compensation include eligible indirect compensation, for which the plan received the required disclosures?	(g) Enter total indirect compensation received by service provider excluding eligible indirect compensation for which you answered "Yes" to element (f). If none, enter -0-.	(h) Did the service provider give you a formula instead of an amount or estimated amount?
			Yes ☐ No ☐	Yes ☐ No ☐		Yes ☐ No ☐

(a) Enter name and EIN or address (see instructions)

(b) Service Code(s)	(c) Relationship to employer, employee organization, or person known to be a party-in-interest	(d) Enter direct compensation paid by the plan. If none, enter -0-.	(e) Did service provider receive indirect compensation? (sources other than plan or plan sponsor)	(f) Did indirect compensation include eligible indirect compensation, for which the plan received the required disclosures?	(g) Enter total indirect compensation received by service provider excluding eligible indirect compensation for which you answered "Yes" to element (f). If none, enter -0-.	(h) Did the service provider give you a formula instead of an amount or estimated amount?
			Yes ☐ No ☐	Yes ☐ No ☐		Yes ☐ No ☐

Part I Service Provider Information (continued)

3. If you reported on line 2 receipt of indirect compensation, other than eligible indirect compensation, by a service provider, and the service provider is a fiduciary or provides contract administrator, consulting, custodial, investment advisory, investment management, broker, or recordkeeping services, answer the following questions for (a) each source from whom the service provider received \$1,000 or more in indirect compensation and (b) each source for whom the service provider gave you a formula used to determine the indirect compensation instead of an amount or estimated amount of the indirect compensation. Complete as many entries as needed to report the required information for each source.

(a) Enter service provider name as it appears on line 2	(b) Service Codes (see instructions)	(c) Enter amount of indirect compensation
FIDELITY INVESTMENTS INSTITUTIONAL	60	0
(d) Enter name and EIN (address) of source of indirect compensation	(e) Describe the indirect compensation, including any formula used to determine the service provider's eligibility for or the amount of the indirect compensation.	
CS CMDITY RET A - DST ASSET MANAGE 430 W 7TH STREET STE 219432 KANSAS CITY, MO 64105	0.45%	
(a) Enter service provider name as it appears on line 2	(b) Service Codes (see instructions)	(c) Enter amount of indirect compensation
(d) Enter name and EIN (address) of source of indirect compensation	(e) Describe the indirect compensation, including any formula used to determine the service provider's eligibility for or the amount of the indirect compensation.	
(a) Enter service provider name as it appears on line 2	(b) Service Codes (see instructions)	(c) Enter amount of indirect compensation
(d) Enter name and EIN (address) of source of indirect compensation	(e) Describe the indirect compensation, including any formula used to determine the service provider's eligibility for or the amount of the indirect compensation.	

Part II Service Providers Who Fail or Refuse to Provide Information

4 Provide, to the extent possible, the following information for each service provider who failed or refused to provide the information necessary to complete this Schedule.

(a) Enter name and EIN or address of service provider (see instructions)	(b) Nature of Service Code(s)	(c) Describe the information that the service provider failed or refused to provide
(a) Enter name and EIN or address of service provider (see instructions)	(b) Nature of Service Code(s)	(c) Describe the information that the service provider failed or refused to provide
(a) Enter name and EIN or address of service provider (see instructions)	(b) Nature of Service Code(s)	(c) Describe the information that the service provider failed or refused to provide
(a) Enter name and EIN or address of service provider (see instructions)	(b) Nature of Service Code(s)	(c) Describe the information that the service provider failed or refused to provide
(a) Enter name and EIN or address of service provider (see instructions)	(b) Nature of Service Code(s)	(c) Describe the information that the service provider failed or refused to provide
(a) Enter name and EIN or address of service provider (see instructions)	(b) Nature of Service Code(s)	(c) Describe the information that the service provider failed or refused to provide

Part III Termination Information on Accountants and Enrolled Actuaries (see instructions)
(complete as many entries as needed)

a Name:	b EIN:
c Position:	
d Address:	e Telephone:

Explanation:

a Name:	b EIN:
c Position:	
d Address:	e Telephone:

Explanation:

a Name:	b EIN:
c Position:	
d Address:	e Telephone:

Explanation:

a Name:	b EIN:
c Position:	
d Address:	e Telephone:

Explanation:

a Name:	b EIN:
c Position:	
d Address:	e Telephone:

Explanation:

SCHEDULE D (Form 5500) Department of the Treasury Internal Revenue Service Department of Labor Employee Benefits Security Administration	DFE/Participating Plan Information This schedule is required to be filed under section 104 of the Employee Retirement Income Security Act of 1974 (ERISA). ► File as an attachment to Form 5500.	OMB No. 1210-0110 2022 This Form is Open to Public Inspection.
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For calendar plan year 2022 or fiscal plan year beginning 01/01/2022 and ending 12/31/2022		
A Name of plan ARROWSTREET CAPITAL L.P. 401(K) PLAN	B Three-digit plan number (PN) ►	001
C Plan or DFE sponsor's name as shown on line 2a of Form 5500 ARROWSTREET CAPITAL L.P.	D Employer Identification Number (EIN) 04-3472863	

Part I	Information on interests in MTIAs, CCTs, PSAs, and 103-12 IEs (to be completed by plans and DFEs) (Complete as many entries as needed to report all interests in DFEs)
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a Name of MTIA, CCT, PSA, or 103-12 IE: INTL EQ EAFE EXT D		
b Name of sponsor of entity listed in (a): GLOBAL TRUST COMPANY ARROWSTREET		
c EIN-PN 35-7119630-006	d Entity code C	e Dollar value of interest in MTIA, CCT, PSA, or 103-12 IE at end of year (see instructions) 10414951
a Name of MTIA, CCT, PSA, or 103-12 IE: GLOBAL ACWI D		
b Name of sponsor of entity listed in (a): GLOBAL TRUST COMPANY ARROWSTREET		
c EIN-PN 37-6607043-002	d Entity code C	e Dollar value of interest in MTIA, CCT, PSA, or 103-12 IE at end of year (see instructions) 7335071
a Name of MTIA, CCT, PSA, or 103-12 IE: INTL EQ ACWI EXUS D		
b Name of sponsor of entity listed in (a): GLOBAL TRUST COMPANY ARROWSTREET		
c EIN-PN 61-6553401-004	d Entity code C	e Dollar value of interest in MTIA, CCT, PSA, or 103-12 IE at end of year (see instructions) 3350567
a Name of MTIA, CCT, PSA, or 103-12 IE:		
b Name of sponsor of entity listed in (a):		
c EIN-PN	d Entity code	e Dollar value of interest in MTIA, CCT, PSA, or 103-12 IE at end of year (see instructions)
a Name of MTIA, CCT, PSA, or 103-12 IE:		
b Name of sponsor of entity listed in (a):		
c EIN-PN	d Entity code	e Dollar value of interest in MTIA, CCT, PSA, or 103-12 IE at end of year (see instructions)
a Name of MTIA, CCT, PSA, or 103-12 IE:		
b Name of sponsor of entity listed in (a):		
c EIN-PN	d Entity code	e Dollar value of interest in MTIA, CCT, PSA, or 103-12 IE at end of year (see instructions)
a Name of MTIA, CCT, PSA, or 103-12 IE:		
b Name of sponsor of entity listed in (a):		
c EIN-PN	d Entity code	e Dollar value of interest in MTIA, CCT, PSA, or 103-12 IE at end of year (see instructions)

a Name of MTIA, CCT, PSA, or 103-12 IE:**b** Name of sponsor of entity listed in (a):**c** EIN-PN**d** Entity
code**e** Dollar value of interest in MTIA, CCT, PSA, or
103-12 IE at end of year (see instructions)**a** Name of MTIA, CCT, PSA, or 103-12 IE:**b** Name of sponsor of entity listed in (a):**c** EIN-PN**d** Entity
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code**e** Dollar value of interest in MTIA, CCT, PSA, or
103-12 IE at end of year (see instructions)**a** Name of MTIA, CCT, PSA, or 103-12 IE:**b** Name of sponsor of entity listed in (a):**c** EIN-PN**d** Entity
code**e** Dollar value of interest in MTIA, CCT, PSA, or
103-12 IE at end of year (see instructions)

Part II **Information on Participating Plans (to be completed by DFEs)**

(Complete as many entries as needed to report all participating plans)

a Plan name**b** Name of
plan sponsor**c** EIN-PN**a** Plan name**b** Name of
plan sponsor**c** EIN-PN**a** Plan name**b** Name of
plan sponsor**c** EIN-PN**a** Plan name**b** Name of
plan sponsor**c** EIN-PN**a** Plan name**b** Name of
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plan sponsor**c** EIN-PN**a** Plan name**b** Name of
plan sponsor**c** EIN-PN**a** Plan name**b** Name of
plan sponsor**c** EIN-PN**a** Plan name**b** Name of
plan sponsor**c** EIN-PN

SCHEDULE H (Form 5500) Department of the Treasury Internal Revenue Service Department of Labor Employee Benefits Security Administration Pension Benefit Guaranty Corporation	Financial Information This schedule is required to be filed under section 104 of the Employee Retirement Income Security Act of 1974 (ERISA), and section 6058(a) of the Internal Revenue Code (the Code). ► File as an attachment to Form 5500.	OMB No. 1210-0110 2022 This Form is Open to Public Inspection
For calendar plan year 2022 or fiscal plan year beginning <u>01/01/2022</u> and ending <u>12/31/2022</u>		
A Name of plan <u>ARROWSTREET CAPITAL L.P. 401(K) PLAN</u>	B Three-digit plan number (PN) ►	<u>001</u>
C Plan sponsor's name as shown on line 2a of Form 5500 <u>ARROWSTREET CAPITAL L.P.</u>	D Employer Identification Number (EIN) <u>04-3472863</u>	

Part I	Asset and Liability Statement		
1 Current value of plan assets and liabilities at the beginning and end of the plan year. Combine the value of plan assets held in more than one trust. Report the value of the plan's interest in a commingled fund containing the assets of more than one plan on a line-by-line basis unless the value is reportable on lines 1c(9) through 1c(14). Do not enter the value of that portion of an insurance contract which guarantees, during this plan year, to pay a specific dollar benefit at a future date. Round off amounts to the nearest dollar. MTIAs, CCTs, PSAs, and 103-12 IEs do not complete lines 1b(1), 1b(2), 1c(8), 1g, 1h, and 1i. CCTs, PSAs, and 103-12 IEs also do not complete lines 1d and 1e. See instructions.			
Assets		(a) Beginning of Year	(b) End of Year
a Total noninterest-bearing cash.....		1a 0	0
b Receivables (less allowance for doubtful accounts):			
(1) Employer contributions.....		1b(1) 0	0
(2) Participant contributions.....		1b(2) 0	0
(3) Other.....		1b(3) 0	0
c General investments:			
(1) Interest-bearing cash (include money market accounts & certificates of deposit).....		1c(1) 2547499	3029153
(2) U.S. Government securities		1c(2) 0	0
(3) Corporate debt instruments (other than employer securities):			
(A) Preferred		1c(3)(A) 0	0
(B) All other		1c(3)(B) 0	0
(4) Corporate stocks (other than employer securities):			
(A) Preferred		1c(4)(A) 0	0
(B) Common.....		1c(4)(B) 0	0
(5) Partnership/joint venture interests		1c(5) 0	0
(6) Real estate (other than employer real property)		1c(6) 0	0
(7) Loans (other than to participants).....		1c(7) 0	0
(8) Participant loans.....		1c(8) 411566	384223
(9) Value of interest in common/collective trusts.....		1c(9) 17060783	21100589
(10) Value of interest in pooled separate accounts		1c(10) 0	0
(11) Value of interest in master trust investment accounts.....		1c(11) 0	0
(12) Value of interest in 103-12 investment entities		1c(12) 0	0
(13) Value of interest in registered investment companies (e.g., mutual funds).....		1c(13) 77729355	69373863
(14) Value of funds held in insurance company general account (unallocated contracts).....		1c(14) 0	0
(15) Other		1c(15) 0	0

1d Employer-related investments:		(a) Beginning of Year	(b) End of Year
(1) Employer securities	1d(1)	0	0
(2) Employer real property	1d(2)	0	0
e Buildings and other property used in plan operation	1e	0	0
f Total assets (add all amounts in lines 1a through 1e)	1f	97749203	93887828

Liabilities

g Benefit claims payable	1g	0	0
h Operating payables	1h	0	0
i Acquisition indebtedness	1i	0	0
j Other liabilities	1j	0	0
k Total liabilities (add all amounts in lines 1g through 1j)	1k	0	0

Net Assets

l Net assets (subtract line 1k from line 1f)	1l	97749203	93887828
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Part II Income and Expense Statement

2 Plan income, expenses, and changes in net assets for the year. Include all income and expenses of the plan, including any trust(s) or separately maintained fund(s) and any payments/receipts to/from insurance carriers. Round off amounts to the nearest dollar. MTIAs, CCTs, PSAs, and 103-12 IEs do not complete lines 2a, 2b(1)(E), 2e, 2f, and 2g.

Income

a Contributions:			
(1) Received or receivable in cash from: (A) Employers.....	2a(1)(A)	4568683	
(B) Participants.....	2a(1)(B)	5888411	
(C) Others (including rollovers).....	2a(1)(C)	5781937	
(2) Noncash contributions.....	2a(2)	0	16239031
(3) Total contributions. Add lines 2a(1)(A) , (B) , (C) , and line 2a(2)	2a(3)		
b Earnings on investments:			
(1) Interest:			
(A) Interest-bearing cash (including money market accounts and certificates of deposit).....	2b(1)(A)	38596	
(B) U.S. Government securities.....	2b(1)(B)	0	
(C) Corporate debt instruments.....	2b(1)(C)	0	
(D) Loans (other than to participants).....	2b(1)(D)	0	
(E) Participant loans.....	2b(1)(E)	17832	
(F) Other.....	2b(1)(F)	0	
(G) Total interest. Add lines 2b(1)(A) through (F)	2b(1)(G)		56428
(2) Dividends: (A) Preferred stock.....	2b(2)(A)	0	
(B) Common stock.....	2b(2)(B)	0	
(C) Registered investment company shares (e.g. mutual funds).....	2b(2)(C)	1750941	
(D) Total dividends. Add lines 2b(2)(A) , (B) , and (C)	2b(2)(D)		1750941
(3) Rents.....	2b(3)		0
(4) Net gain (loss) on sale of assets: (A) Aggregate proceeds.....	2b(4)(A)	0	
(B) Aggregate carrying amount (see instructions).....	2b(4)(B)	0	
(C) Subtract line 2b(4)(B) from line 2b(4)(A) and enter result.....	2b(4)(C)		
(5) Unrealized appreciation (depreciation) of assets: (A) Real estate.....	2b(5)(A)	0	
(B) Other.....	2b(5)(B)	0	
(C) Total unrealized appreciation of assets. Add lines 2b(5)(A) and (B)	2b(5)(C)		

		(a) Amount	(b) Total
(6) Net investment gain (loss) from common/collective trusts	2b(6)		-1111215
(7) Net investment gain (loss) from pooled separate accounts	2b(7)		0
(8) Net investment gain (loss) from master trust investment accounts	2b(8)		0
(9) Net investment gain (loss) from 103-12 investment entities.....	2b(9)		0
(10) Net investment gain (loss) from registered investment companies (e.g., mutual funds)	2b(10)		-17993932
c Other income	2c		0
d Total income. Add all income amounts in column (b) and enter total	2d		-1058747
Expenses			
e Benefit payment and payments to provide benefits:			
(1) Directly to participants or beneficiaries, including direct rollovers	2e(1)	2810530	
(2) To insurance carriers for the provision of benefits	2e(2)	0	
(3) Other	2e(3)	0	
(4) Total benefit payments. Add lines 2e(1) through (3)	2e(4)		2810530
f Corrective distributions (see instructions)	2f		0
g Certain deemed distributions of participant loans (see instructions)	2g		0
h Interest expense	2h		0
i Administrative expenses: (1) Professional fees	2i(1)	0	
(2) Contract administrator fees	2i(2)	0	
(3) Investment advisory and management fees	2i(3)	0	
(4) Other	2i(4)	-7902	
(5) Total administrative expenses. Add lines 2i(1) through (4)	2i(5)		-7902
j Total expenses. Add all expense amounts in column (b) and enter total	2j		2802628
Net Income and Reconciliation			
k Net income (loss). Subtract line 2j from line 2d	2k		-3861375
l Transfers of assets:			
(1) To this plan	2l(1)		0
(2) From this plan	2l(2)		0

Part III Accountant's Opinion

3 Complete lines 3a through 3c if the opinion of an independent qualified public accountant is attached to this Form 5500. Complete line 3d if an opinion is not attached.

a The attached opinion of an independent qualified public accountant for this plan is (see instructions):

(1) ☒ Unmodified (2) ☐ Qualified (3) ☐ Disclaimer (4) ☐ Adverse

b Check the appropriate box(es) to indicate whether the IQPA performed an ERISA section 103(a)(3)(C) audit. Check both boxes (1) and (2) if the audit was performed pursuant to both 29 CFR 2520.103-8 and 29 CFR 2520.103-12(d). Check box (3) if pursuant to neither.

(1) ☒ DOL Regulation 2520.103-8 (2) ☐ DOL Regulation 2520.103-12(d) (3) ☐ neither DOL Regulation 2520.103-8 nor DOL Regulation 2520.103-12(d).

c Enter the name and EIN of the accountant (or accounting firm) below:

(1) Name: **ERNST & YOUNG LLP**

(2) EIN: **34-6565596**

d The opinion of an independent qualified public accountant is **not attached** because:

(1) ☐ This form is filed for a CCT, PSA, or MTIA. (2) ☐ It will be attached to the next Form 5500 pursuant to 29 CFR 2520.104-50.

Part IV Compliance Questions

4 CCTs and PSAs do not complete Part IV. MTIAs, 103-12 IEs, and GIAs do not complete lines 4a, 4e, 4f, 4g, 4h, 4k, 4m, 4n, or 5. 103-12 IEs also do not complete lines 4j and 4l. MTIAs also do not complete line 4l.

During the plan year:

a Was there a failure to transmit to the plan any participant contributions within the time period described in 29 CFR 2510.3-102? Continue to answer "Yes" for any prior year failures until fully corrected. (See instructions and DOL's Voluntary Fiduciary Correction Program.)

	Yes	No	Amount
4a		X	

	Yes	No	Amount
b Were any loans by the plan or fixed income obligations due the plan in default as of the close of the plan year or classified during the year as uncollectible? Disregard participant loans secured by participant's account balance. (Attach Schedule G (Form 5500) Part I if "Yes" is checked.)			
4b		X	
c Were any leases to which the plan was a party in default or classified during the year as uncollectible? (Attach Schedule G (Form 5500) Part II if "Yes" is checked.)			
4c		X	
d Were there any nonexempt transactions with any party-in-interest? (Do not include transactions reported on line 4a. Attach Schedule G (Form 5500) Part III if "Yes" is checked.)			
4d		X	
e Was this plan covered by a fidelity bond?	X		500000
f Did the plan have a loss, whether or not reimbursed by the plan's fidelity bond, that was caused by fraud or dishonesty?		X	
4f		X	
g Did the plan hold any assets whose current value was neither readily determinable on an established market nor set by an independent third party appraiser?			
4g		X	
h Did the plan receive any noncash contributions whose value was neither readily determinable on an established market nor set by an independent third party appraiser?			
4h		X	
i Did the plan have assets held for investment? (Attach schedule(s) of assets if "Yes" is checked, and see instructions for format requirements.)	X		
4i	X		
j Were any plan transactions or series of transactions in excess of 5% of the current value of plan assets? (Attach schedule of transactions if "Yes" is checked and see instructions for format requirements.)			
4j		X	
k Were all the plan assets either distributed to participants or beneficiaries, transferred to another plan, or brought under the control of the PBGC?			
4k		X	
l Has the plan failed to provide any benefit when due under the plan?			
4l		X	
m If this is an individual account plan, was there a blackout period? (See instructions and 29 CFR 2520.101-3.)			
4m		X	
n If 4m was answered "Yes," check the "Yes" box if you either provided the required notice or one of the exceptions to providing the notice applied under 29 CFR 2520.101-3.			
4n		X	

5a Has a resolution to terminate the plan been adopted during the plan year or any prior plan year? ☐ Yes ☒ No
If "Yes," enter the amount of any plan assets that reverted to the employer this year _____.

5b If, during this plan year, any assets or liabilities were transferred from this plan to another plan(s), identify the plan(s) to which assets or liabilities were transferred. (See instructions.)

5b(1) Name of plan(s)	5b(2) EIN(s)	5b(3) PN(s)

5c Was the plan a defined benefit plan covered under the PBGC insurance program at any time during this plan year? (See ERISA section 4021 and instructions.) ☐ Yes ☐ No ☐ Not determined
If "Yes" is checked, enter the My PAA confirmation number from the PBGC premium filing for this plan year _____.

SCHEDULE R (Form 5500) Department of the Treasury Internal Revenue Service Department of Labor Employee Benefits Security Administration Pension Benefit Guaranty Corporation	Retirement Plan Information This schedule is required to be filed under sections 104 and 4065 of the Employee Retirement Income Security Act of 1974 (ERISA) and section 6058(a) of the Internal Revenue Code (the Code). ► File as an attachment to Form 5500.	OMB No. 1210-0110 2022 This Form is Open to Public Inspection.
For calendar plan year 2022 or fiscal plan year beginning 01/01/2022 and ending 12/31/2022		
A Name of plan ARROWSTREET CAPITAL L.P. 401(K) PLAN		B Three-digit plan number (PN) ► 001
C Plan sponsor's name as shown on line 2a of Form 5500 ARROWSTREET CAPITAL L.P.		D Employer Identification Number (EIN) 04-3472863
Part I Distributions		
All references to distributions relate only to payments of benefits during the plan year.		
1 Total value of distributions paid in property other than in cash or the forms of property specified in the instructions.....		1
2 Enter the EIN(s) of payor(s) who paid benefits on behalf of the plan to participants or beneficiaries during the year (if more than two, enter EINs of the two payors who paid the greatest dollar amounts of benefits): EIN(s): 04-6568107		
Profit-sharing plans, ESOPs, and stock bonus plans, skip line 3.		
3 Number of participants (living or deceased) whose benefits were distributed in a single sum, during the plan year.....		3
Part II Funding Information (If the plan is not subject to the minimum funding requirements of section 412 of the Internal Revenue Code or ERISA section 302, skip this Part.)		
4 Is the plan administrator making an election under Code section 412(d)(2) or ERISA section 302(d)(2)? ☐ Yes ☐ No ☐ N/A If the plan is a defined benefit plan, go to line 8.		
5 If a waiver of the minimum funding standard for a prior year is being amortized in this plan year, see instructions and enter the date of the ruling letter granting the waiver. Date: Month _____ Day _____ Year _____ If you completed line 5, complete lines 3, 9, and 10 of Schedule MB and do not complete the remainder of this schedule.		
6 a Enter the minimum required contribution for this plan year (include any prior year accumulated funding deficiency not waived).....		6a
b Enter the amount contributed by the employer to the plan for this plan year.....		6b
c Subtract the amount in line 6b from the amount in line 6a. Enter the result (enter a minus sign to the left of a negative amount).....		6c
If you completed line 6c, skip lines 8 and 9.		
7 Will the minimum funding amount reported on line 6c be met by the funding deadline? ☐ Yes ☐ No ☐ N/A		
8 If a change in actuarial cost method was made for this plan year pursuant to a revenue procedure or other authority providing automatic approval for the change or a class ruling letter, does the plan sponsor or plan administrator agree with the change? ☐ Yes ☐ No ☐ N/A		
Part III Amendments		
9 If this is a defined benefit pension plan, were any amendments adopted during this plan year that increased or decreased the value of benefits? If yes, check the appropriate box. If no, check the "No" box..... ☐ Increase ☐ Decrease ☐ Both ☐ No		
Part IV ESOPs (see instructions). If this is not a plan described under section 409(a) or 4975(e)(7) of the Internal Revenue Code, skip this Part.		
10 Were unallocated employer securities or proceeds from the sale of unallocated securities used to repay any exempt loan?..... ☐ Yes ☐ No		
11 a Does the ESOP hold any preferred stock?..... ☐ Yes ☐ No		
b If the ESOP has an outstanding exempt loan with the employer as lender, is such loan part of a "back-to-back" loan? (See instructions for definition of "back-to-back" loan.)..... ☐ Yes ☐ No		
12 Does the ESOP hold any stock that is not readily tradable on an established securities market?..... ☐ Yes ☐ No		
For Paperwork Reduction Act Notice, see the Instructions for Form 5500.		
Schedule R (Form 5500) 2022 v. 220413		

Part V Additional Information for Multiemployer Defined Benefit Pension Plans

13 Enter the following information for each employer that (1) contributed more than 5% of total contributions to the plan during the plan year or (2) was one of the top-ten highest contributors (measured in dollars). See instructions. *Complete as many entries as needed to report all applicable employers.*

a Name of contributing employer

b EIN

c Dollar amount contributed by employer

d Date collective bargaining agreement expires (If employer contributes under more than one collective bargaining agreement, check box ☐ and see instructions regarding required attachment. Otherwise, enter the applicable date.) Month _____ Day _____ Year _____

e Contribution rate information (If more than one rate applies, check this box ☐ and see instructions regarding required attachment. Otherwise, complete lines 13e(1) and 13e(2).)

(1) Contribution rate (in dollars and cents) _____

(2) Base unit measure: ☐ Hourly ☐ Weekly ☐ Unit of production ☐ Other (specify): _____

a Name of contributing employer

b EIN

c Dollar amount contributed by employer

d Date collective bargaining agreement expires (If employer contributes under more than one collective bargaining agreement, check box ☐ and see instructions regarding required attachment. Otherwise, enter the applicable date.) Month _____ Day _____ Year _____

e Contribution rate information (If more than one rate applies, check this box ☐ and see instructions regarding required attachment. Otherwise, complete lines 13e(1) and 13e(2).)

(1) Contribution rate (in dollars and cents) _____

(2) Base unit measure: ☐ Hourly ☐ Weekly ☐ Unit of production ☐ Other (specify): _____

a Name of contributing employer

b EIN

c Dollar amount contributed by employer

d Date collective bargaining agreement expires (If employer contributes under more than one collective bargaining agreement, check box ☐ and see instructions regarding required attachment. Otherwise, enter the applicable date.) Month _____ Day _____ Year _____

e Contribution rate information (If more than one rate applies, check this box ☐ and see instructions regarding required attachment. Otherwise, complete lines 13e(1) and 13e(2).)

(1) Contribution rate (in dollars and cents) _____

(2) Base unit measure: ☐ Hourly ☐ Weekly ☐ Unit of production ☐ Other (specify): _____

a Name of contributing employer

b EIN

c Dollar amount contributed by employer

d Date collective bargaining agreement expires (If employer contributes under more than one collective bargaining agreement, check box ☐ and see instructions regarding required attachment. Otherwise, enter the applicable date.) Month _____ Day _____ Year _____

e Contribution rate information (If more than one rate applies, check this box ☐ and see instructions regarding required attachment. Otherwise, complete lines 13e(1) and 13e(2).)

(1) Contribution rate (in dollars and cents) _____

(2) Base unit measure: ☐ Hourly ☐ Weekly ☐ Unit of production ☐ Other (specify): _____

a Name of contributing employer

b EIN

c Dollar amount contributed by employer

d Date collective bargaining agreement expires (If employer contributes under more than one collective bargaining agreement, check box ☐ and see instructions regarding required attachment. Otherwise, enter the applicable date.) Month _____ Day _____ Year _____

e Contribution rate information (If more than one rate applies, check this box ☐ and see instructions regarding required attachment. Otherwise, complete lines 13e(1) and 13e(2).)

(1) Contribution rate (in dollars and cents) _____

(2) Base unit measure: ☐ Hourly ☐ Weekly ☐ Unit of production ☐ Other (specify): _____

a Name of contributing employer

b EIN

c Dollar amount contributed by employer

d Date collective bargaining agreement expires (If employer contributes under more than one collective bargaining agreement, check box ☐ and see instructions regarding required attachment. Otherwise, enter the applicable date.) Month _____ Day _____ Year _____

e Contribution rate information (If more than one rate applies, check this box ☐ and see instructions regarding required attachment. Otherwise, complete lines 13e(1) and 13e(2).)

(1) Contribution rate (in dollars and cents) _____

(2) Base unit measure: ☐ Hourly ☐ Weekly ☐ Unit of production ☐ Other (specify): _____

14	Enter the number of deferred vested and retired participants (inactive participants), as of the beginning of the plan year, whose contributing employer is no longer making contributions to the plan for:		
	a The current plan year. Check the box to indicate the counting method used to determine the number of inactive participants: ☐ last contributing employer ☐ alternative ☐ reasonable approximation (see instructions for required attachment).....	14a	
	b The plan year immediately preceding the current plan year. ☐ Check the box if the number reported is a change from what was previously reported (see instructions for required attachment)	14b	
	c The second preceding plan year. ☐ Check the box if the number reported is a change from what was previously reported (see instructions for required attachment)	14c	
15	Enter the ratio of the number of participants under the plan on whose behalf no employer had an obligation to make an employer contribution during the current plan year to:		
	a The corresponding number for the plan year immediately preceding the current plan year.....	15a	
	b The corresponding number for the second preceding plan year.....	15b	
16	Information with respect to any employers who withdrew from the plan during the preceding plan year:		
	a Enter the number of employers who withdrew during the preceding plan year	16a	
	b If line 16a is greater than 0, enter the aggregate amount of withdrawal liability assessed or estimated to be assessed against such withdrawn employers.....	16b	
17	If assets and liabilities from another plan have been transferred to or merged with this plan during the plan year, check box and see instructions regarding supplemental information to be included as an attachment ☐		

Part VI	Additional Information for Single-Employer and Multiemployer Defined Benefit Pension Plans
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18	If any liabilities to participants or their beneficiaries under the plan as of the end of the plan year consist (in whole or in part) of liabilities to such participants and beneficiaries under two or more pension plans as of immediately before such plan year, check box and see instructions regarding supplemental information to be included as an attachment ☐
19	If the total number of participants is 1,000 or more, complete lines (a) through (c) a Enter the percentage of plan assets held as: Stock: _____% Investment-Grade Debt: _____% High-Yield Debt: _____% Real Estate: _____% Other: _____% b Provide the average duration of the combined investment-grade and high-yield debt: ☐ 0-3 years ☐ 3-6 years ☐ 6-9 years ☐ 9-12 years ☐ 12-15 years ☐ 15-18 years ☐ 18-21 years ☐ 21 years or more c What duration measure was used to calculate line 19(b)? ☐ Effective duration ☐ Macaulay duration ☐ Modified duration ☐ Other (specify): _____
20	PBGC missed contribution reporting requirements. If this is a multiemployer plan or a single-employer plan that is not covered by PBGC, skip line 20. a Is the amount of unpaid minimum required contributions for all years from Schedule SB (Form 5500) line 40 greater than zero? ☐ Yes ☐ No b If line 20a is "Yes," has PBGC been notified as required by ERISA sections 4043(c)(5) and/or 303(k)(4)? Check the applicable box: ☐ Yes. ☐ No. Reporting was waived under 29 CFR 4043.25(c)(2) because contributions equal to or exceeding the unpaid minimum required contribution were made by the 30th day after the due date. ☐ No. The 30-day period referenced in 29 CFR 4043.25(c)(2) has not yet ended, and the sponsor intends to make a contribution equal to or exceeding the unpaid minimum required contribution by the 30th day after the due date. ☐ No. Other. Provide explanation _____

ARROWSTREET CAPITAL, L.P. 401(k) PLAN

Financial Statements and Supplemental Schedule

December 31, 2022 and 2021

(With Independent Auditors' Report Thereon)

ARROWSTREET CAPITAL, L.P. 401(k) PLAN

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* Other schedules required by Section 2520.103-10 of the Department of Labor Rules and Regulations for Reporting and Disclosure under ERISA have been omitted because they are not applicable.	

Report of Independent Auditors

The Participants and Administrator of
Arrowstreet Capital, L.P. 401(k) Plan:

Scope and Nature of the ERISA Section 103(a)(3)(C) Audit

We have performed audits of the financial statements of Arrowstreet Capital, L.P. 401(k) Plan (the Plan), an employee benefit plan subject to the Employee Retirement Income Security Act of 1974 (ERISA), as permitted by ERISA Section 103(a)(3)(C) (ERISA Section 103(a)(3)(C) audit). The financial statements comprise the statements of net assets available for benefits as of December 31, 2022 and 2021, and the related statements of changes in net assets available for benefits for the years then ended, and the related notes (collectively referred to as the “financial statements”).

Management, having determined it is permissible in the circumstances, has elected to have the audits of the financial statements performed in accordance with ERISA Section 103(a)(3)(C) pursuant to 29 CFR 2520.103-8 of the Department of Labor’s Rules and Regulations for Reporting and Disclosure under ERISA. As permitted by ERISA Section 103(a)(3)(C), our audits need not extend to any statements or information related to assets held for investment of the Plan (investment information) by a bank or similar institution or insurance carrier that is regulated, supervised, and subject to periodic examination by a state or federal agency, provided that the statements or information regarding assets so held are prepared and certified to by the bank or similar institution or insurance carrier in accordance with 29 CFR 2520.103-5 of the Department of Labor’s Rules and Regulations for Reporting and Disclosure under ERISA (qualified institution).

Management has obtained certifications from a qualified institution as of December 31, 2022 and 2021, and for the years then ended, stating that the certified investment information, as described in Note 3 to the financial statements, is complete and accurate.

Opinion

In our opinion, based on our audits and on the procedures performed as described in the Auditor’s Responsibilities for the Audit of the Financial Statements section

- the amounts and disclosures in the accompanying financial statements, other than those agreed to or derived from the certified investment information, are presented fairly, in all material respects, in accordance with accounting principles generally accepted in the United States of America.
- the information in the accompanying financial statements related to assets held by and certified to by a qualified institution agrees to, or is derived from, in all material respects, the information prepared and certified by an institution that management determined meets the requirements of ERISA Section 103(a)(3)(C).

Basis for Opinion

We conducted our audits in accordance with auditing standards generally accepted in the United States of America (GAAS). Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are required to be independent of the Plan and to meet our other ethical responsibilities in accordance with the relevant ethical requirements relating to our audits. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our ERISA Section 103(a)(3)(C) audit opinion.

Responsibilities of Management for the Financial Statements

Management is responsible for the preparation and fair presentation of the financial statements in accordance with accounting principles generally accepted in the United States of America, and for the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error. Management's election of the ERISA Section 103(a)(3)(C) audit does not affect management's responsibility for the financial statements.

In preparing the financial statements, management is required to evaluate whether there are conditions or events, considered in the aggregate, that raise substantial doubt about the Plan's ability to continue as a going concern for one year after the date that the financial statements are available to be issued.

Management is also responsible for maintaining a current plan instrument, including all plan amendments, administering the Plan, and determining that the Plan's transactions that are presented and disclosed in the financial statements are in conformity with the Plan's provisions, including maintaining sufficient records with respect to each of the participants, to determine the benefits due or which may become due to such participants.

Auditor's Responsibilities for the Audit of the Financial Statements

Except as described in the Scope and Nature of the ERISA Section 103(a)(3)(C) Audit section of our report, our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance but is not absolute assurance and therefore is not a guarantee that an audit conducted in accordance with GAAS will always detect a material misstatement when it exists. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control. Misstatements are considered material if there is a substantial likelihood that, individually or in the aggregate, they would influence the judgment made by a reasonable user based on the financial statements.

In performing an audit in accordance with GAAS, we:

- Exercise professional judgment and maintain professional skepticism throughout the audit.
- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, and design and perform audit procedures responsive to those risks. Such procedures include examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements.

- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Plan's internal control. Accordingly, no such opinion is expressed.
- Evaluate the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluate the overall presentation of the financial statements.
- Conclude whether, in our judgment, there are conditions or events, considered in the aggregate, that raise substantial doubt about the Plan's ability to continue as a going concern for a reasonable period of time.

Our audits did not extend to the certified investment information, except for obtaining and reading the certification, comparing the certified investment information with the related information presented and disclosed in the financial statements, and reading the disclosures relating to the certified investment information to assess whether they are in accordance with the presentation and disclosure requirements of accounting principles generally accepted in the United States of America.

Accordingly, the objective of an ERISA Section 103(a)(3)(C) audit is not to express an opinion about whether the financial statements as a whole are presented fairly, in all material respects, in accordance with accounting principles generally accepted in the United States of America.

We are required to communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit, significant audit findings, and certain internal control related matters that we identified during the audit.

Other Matter

Supplemental Schedules Required by ERISA

The supplemental schedule of assets (held at end of year) as of December 31, 2022 (referred to as the "supplemental schedule"), is presented for purposes of additional analysis and is not a required part of the financial statements but is supplementary information required by the Department of Labor's Rules and Regulations for Reporting and Disclosure under ERISA. Such information is the responsibility of management and was derived from and relates directly to the underlying accounting and other records used to prepare the financial statements. The information included in the supplemental schedule, other than that agreed to or derived from the certified investment information, has been subjected to auditing procedures applied in the audits of the financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the financial statements or to the financial statements themselves, and other additional procedures in accordance with GAAS. For information included in the supplemental schedule that agreed to or is derived from the certified investment information, we compared such information to the related certified investment information.

In forming our opinion on the supplemental schedule, we evaluated whether the supplemental schedule, other than the information agreed to or derived from the certified investment information, including its form and content, is presented in conformity with the Department of Labor's Rules and Regulations for Reporting and Disclosure under ERISA.

In our opinion

- the form and content of the supplemental schedule, other than the information in the supplemental schedule that agreed to or is derived from the certified investment information, are presented, in all material respects, in conformity with the Department of Labor's Rules and Regulations for Reporting and Disclosure under ERISA.
- the information in the supplemental schedule related to assets held by and certified to by a qualified institution agrees to, or is derived from, in all material respects, the information prepared and certified by an institution that management determined meets the requirements of ERISA Section 103(a)(3)(C).

Ernst & Young LLP

October 6, 2023

ARROWSTREET CAPITAL, L.P. 401(k) PLAN

Statements of Net Assets Available for Benefits

December 31, 2022 and 2021

	<u>2022</u>	<u>2021</u>
Assets:		
Investments, at fair value:		
Mutual funds (notes 3 and 4)	\$ 72,403,016	80,276,854
Collective investment trust funds (notes 3 and 4)	<u>21,100,589</u>	<u>17,060,783</u>
Total investments	<u>93,503,605</u>	<u>97,337,637</u>
Receivables:		
Employer contributions	5,366,023	4,568,458
Loans to participants (note 2)	<u>384,223</u>	<u>411,566</u>
Total receivables	<u>5,750,246</u>	<u>4,980,024</u>
Total assets	<u>99,253,851</u>	<u>102,317,661</u>
Net assets available for benefits	<u>\$ 99,253,851</u>	<u>102,317,661</u>

See accompanying notes to financial statements.

ARROWSTREET CAPITAL, L.P. 401(k) PLAN

Statements of Changes in Net Assets Available for Benefits

Years ended December 31, 2022 and 2021

	<u>2022</u>	<u>2021</u>
Additions to net assets attributed to:		
Investment income (note 3):		
Interest and dividend income	\$ 1,789,533	2,700,824
Net realized and unrealized depreciation in fair value of investments	<u>(19,104,918)</u>	<u>10,661,678</u>
Total Investment income	<u>(17,315,385)</u>	<u>13,362,502</u>
Interest income on loans receivable from participants (note 2)	17,832	16,427
Contributions:		
Employer:		
Employer match	3,002,452	2,568,287
Safe harbor nonelective	2,363,571	2,000,171
Employee:		
Employee pre-tax	4,995,422	4,703,305
Employee after-tax	892,989	758,386
Rollovers	<u>5,781,937</u>	<u>3,986,819</u>
Total Contributions	<u>17,036,371</u>	<u>14,016,968</u>
Total Net Additions	<u>(261,182)</u>	<u>27,395,897</u>
Deductions from net assets attributed to:		
Distributions to participants	(2,810,530)	(5,231,466)
Administrative expenses, net of participant credits	<u>7,902</u>	<u>5,669</u>
Total Deductions	<u>(2,802,628)</u>	<u>(5,225,797)</u>
Net decrease in net assets available for benefits	<u>(3,063,810)</u>	<u>22,170,100</u>
Net assets available for benefits:		
Beginning of year	<u>102,317,661</u>	<u>80,147,561</u>
End of year	<u>\$ 99,253,851</u>	<u>102,317,661</u>

See accompanying notes to financial statements.

ARROWSTREET CAPITAL, L.P. 401(k) PLAN

Notes to Financial Statements

December 31, 2022 and 2021

(1) Description of the Plan

The following description of the Arrowstreet Capital, L.P. 401(k) Plan (the Plan) provides only general information. Participants of the Plan should refer to the plan document for a more complete description of the Plan's provisions.

(a) General

The Plan is a defined contribution retirement and savings plan under Section 401(k) of the Internal Revenue Code (IRC), sponsored by Arrowstreet Capital, L.P. (the Company, Employer, Plan Sponsor, and Plan Administrator). Employees of the Company are eligible to participate in the Plan upon employment. The Plan is subject to the provisions of the Employee Retirement Income Security Act of 1974 (ERISA), as amended.

(b) Participant Accounts

Each participant account is credited with the participant's contributions and the Company's matching contributions and allocations of plan earnings, and is charged with an allocation of administrative credits or expenses, as applicable. Plan earnings are allocated based on the participant's share of net earnings or losses of their respective elected investment options. Allocations of administrative credits or expenses are based in accordance with plan documents. The benefit to which a participant is entitled is the benefit that can be provided from the participant's vested account.

(c) Contributions

(i) Employer Contribution

The total amount of employer contribution (Employer Contribution) is determined annually by the Company and is subject to certain limitations on the amount that can be contributed on behalf of any single participant under the IRC. The Company's safe harbor contributions are calculated as 3% of net earnings subject to a limit of \$9,150 and \$8,700 per employee in 2022 and 2021, respectively. The Company may also match the participant's contribution up to 4% of the participant's net earnings, subject to a limit of \$12,200 and \$11,600 per plan participant in 2022 and 2021, respectively.

(ii) Participant Contributions

Participants may voluntarily make contributions (Employee Contributions) subject to certain limitations. Participants could contribute up to 80% of their eligible pre-tax and/or after-tax compensation to the Plan but could not exceed the annual dollar limit allowed by the IRC of \$20,500 in 2022 and \$19,500 in 2021. Participant contributions are made through pre-tax and/or Roth after-tax 401(k) salary reduction contributions. Participants who attained at least fifty years of age during the year could make additional contributions from their eligible pre-tax and/or after-tax compensation (catch-up contributions) of up to \$6,500 in 2022 and 2021.

(d) Investment Alternatives

Each participant is responsible for determining how his or her individual account balance is invested, from a listing of permissible investment options.

(e) Vesting

All Employee Contributions and earnings thereon are fully vested at all times. A participant is fully vested immediately in Employer Contributions and earnings thereon.

ARROWSTREET CAPITAL, L.P. 401(k) PLAN

Notes to Financial Statements

December 31, 2022 and 2021

(f) Benefits

Benefits are payable to each participant or each participant's beneficiary upon the participant's death, disability, retirement, attainment of age 59½ or termination of employment. In certain circumstances, participants may also make discretionary or hardship withdrawals.

(g) Loans to Participants

Participants actively employed by the Company may borrow from their fund account a minimum of \$1,000 up to 50% of their vested retirement account balance up to a maximum of \$50,000 minus their highest outstanding balance in the past 12 months (if any). The loans are secured by the balance in the participant's account. The loan interest rate, determined quarterly, is set at one percent above the prime rate, as defined. Principal and interest is paid ratably through bi-weekly or monthly payroll deductions over not more than five years. If a participant terminates employment with the Company, they must pay the balance in full. If the loan is not repaid, it will automatically be treated as a distribution to the participant after three months.

(h) Termination

Although it has not expressed any intent to do so, the Company has the right under the Plan to discontinue its contributions at any time and to terminate the Plan subject to the provisions of ERISA.

(2) Summary of Significant Accounting Policies

The following is a summary of significant accounting policies.

(a) Basis of Accounting

The Plan's financial statements have been prepared on the accrual basis of accounting in accordance with generally accepted accounting principles.

(b) Investment Valuation and Income Recognition

Investments are stated at fair value. Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date.

If available, a readily determinable fair value is used to value investments, including valuation for Mutual and Collective Investment Trust (CIT) funds. Quoted market prices and net asset values (NAV) are used.

Purchases and sales of securities are recorded on a trade-date basis. Interest income is recorded on the accrual basis. Dividends are recorded on the ex-dividend date. Net realized and unrealized appreciation (depreciation) in fair value of investments includes gains and losses on investments bought and sold as well as held during the year.

(c) Payment of Benefits

Benefits are recorded when paid.

(d) Loans Receivable from Participants

Loans receivable from participants represent participant loans that are recorded at their unpaid principal balance plus any accrued but unpaid interest. Interest income on loans receivable from participants is recorded when it is earned. Related fees are recorded as administrative expenses when they are incurred. No allowance for credit losses has been recorded as of December 31, 2022 or 2021.

ARROWSTREET CAPITAL, L.P. 401(k) PLAN

Notes to Financial Statements

December 31, 2022 and 2021

(e) Expenses

Certain administrative expenses such as auditing and legal fees are paid directly by the Company and, accordingly, are not reflected in the accompanying financial statements. However, other administrative costs, such as check charges for participant distributions are paid for by the participants. Participant-paid expenses are deducted directly from their account balance and, therefore, are reflected in the accompanying financial statements.

(f) Use of Estimates

The preparation of financial statements in conformity with U.S. generally accepted accounting principles (GAAP) requires the Plan Administrator to make estimates and assumptions that affect the reported amounts of assets and liabilities, and changes therein, and disclosure of contingent assets and liabilities. Actual results could differ from those estimates.

(3) Investments

Certain information related to investments disclosed in the accompanying financial statements and supplemental schedule, including investments held and loans receivable from participants at December 31, 2022 and 2021, and net realized and unrealized appreciation in fair value of investments, interest and dividend income, and interest income on loans receivable from participants for the years then ended, was obtained or derived from information provided to the Plan Administrator and certified as complete and accurate by Fidelity Management Trust Company, the Trustee of the Plan.

(4) Fair Value Measurements

ASC Topic 820, *Fair Value Measurement*, establishes a framework for measuring fair value. That framework provides a fair value hierarchy that prioritizes the inputs to valuation techniques used to measure fair value. The hierarchy gives the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities (Level 1 measurements) and the lowest priority to unobservable inputs (Level 3 measurements). The three levels of the fair value hierarchy under ASC 820 are described as follows:

Level 1 Inputs to the valuation methodology are unadjusted quoted prices for identical assets or liabilities in active markets that the Plan has the ability to access.

Level 2 Inputs that are derived principally from or corroborated by observable market data by correlation or other means.

If the asset or liability has a specified (contractual) term, the Level 2 input must be observable for substantially the full term of the asset or liability.

Inputs to the valuation methodology include:

Quoted prices for similar assets or liabilities in active markets; quoted prices for identical or similar assets or liabilities in inactive markets.

Level 3 Inputs to the valuation methodology are unobservable and significant to the fair value measurement.

ARROWSTREET CAPITAL, L.P. 401(k) PLAN

Notes to Financial Statements

December 31, 2022 and 2021

The asset or liability's fair value measurement level within the fair value hierarchy is based on the lowest level of any input that is significant to the fair value measurement.

As of December 31, 2022 and 2021, the Plan assets consisted solely of Mutual and CIT fund investments. Mutual funds are valued at the quoted NAV of shares held by the Plan at year-end (a Level 1 measurement). CIT funds are deemed to have a readily determinable fair value (a Level 1 measurement).

The following table sets forth by level, within the fair value hierarchy, the Plan's investments at fair value as of December 31, 2022:

Investments at fair value as of December 31, 2022				
	Level 1	Level 2	Level 3	Total
Mutual funds	\$ 72,403,016	—	—	72,403,016
Collective Investment Trust funds	21,100,589	—	—	21,100,589
Total investments, at fair value	\$ 93,503,605	—	—	93,503,605

The following table sets forth by level, within the fair value hierarchy, the Plan's investments at fair value as of December 31, 2021:

Investments at fair value as of December 31, 2021				
	Level 1	Level 2	Level 3	Total
Mutual funds	\$ 80,276,854	—	—	80,276,854
Collective Investment Trust funds	17,060,783	—	—	17,060,783
Total investments, at fair value	\$ 97,337,637	—	—	97,337,637

There were no transfers between levels during 2022 and 2021.

ARROWSTREET CAPITAL, L.P. 401(k) PLAN

Notes to Financial Statements

December 31, 2022 and 2021

(5) Tax Status

The underlying volume submitter plan has received an advisory letter from the Internal Revenue Service (IRS) dated June 30, 2020, stating that the form of the plan is qualified under Section 401 of the IRC and, therefore, the related trust is tax-exempt. The Plan Administrator has determined that it is eligible to, and has chosen to rely on the current IRS volume submitter advisory letter. Once qualified, the Plan is required to operate in conformity with the Internal Revenue Code to maintain its qualified status. The Plan Administrator believes the Plan is being operated in compliance with the applicable requirements of the Internal Revenue Code and, therefore, believes the Plan is qualified and the related trust is tax-exempt.

Accounting principles generally accepted in the United States require plan management to evaluate tax positions taken by the Plan and recognize a tax liability if the Plan has taken an uncertain position that more likely than not would not be sustained upon examination by the IRS. Plan management has analyzed the tax positions taken by the Plan, and has concluded that there are no uncertain positions taken or expected to be taken. The Plan is subject to routine audits by taxing jurisdictions; however, there are currently no audits for any tax periods in progress.

(6) Related Party and Party-in-Interest Transactions

The Plan's record keeper and Trustee are Fidelity Investments Institutional Operations Company, Inc. (FIIOC) and Fidelity Management Trust Company (FMTC), respectively. Both FIIOC and FMTC are related parties to the Plan. In addition, investment transactions with Fidelity and certain administrative expenses paid directly by the Company (note 2(d) and 2(e)) qualify as party-in-interest transactions.

Payment of a management fee to the Company with respect to the interests held by the Plan would be a prohibited transaction under ERISA; however, the Company does not receive a management fee with respect to shares of any Company managed-CIT that are held by the Plan.

(7) Risks and Uncertainties

The Plan invests in various investment securities. Investment securities are exposed to various risks such as interest rate, market, and credit risks. Due to the level of risk associated with certain investment securities, it is at least reasonably possible that changes in the values of investment securities will occur in the near term and that such changes could materially affect participants' account balances and the amounts reported in the statements of net assets available for benefits.

(8) Subsequent Events

Plan management has evaluated the need for disclosure and/or adjustments resulting from subsequent events through October 6, 2023, which represents the date the financial statements were available to be issued.

ARROWSTREET CAPITAL, L.P. 401(k) PLAN

Notes to Financial Statements

December 31, 2022 and 2021

(9) Reconciliation of Financial Statements to Form 5500

The following is a reconciliation of net assets available for benefits per the financial statements to the Plan's Form 5500 at December 31:

	<u>2022</u>	<u>2021</u>
Net assets available for benefits per the financial statements	\$ 99,253,851	102,317,661
Less, current year employer contribution receivable	<u>(5,366,023)</u>	<u>(4,568,458)</u>
Net assets available for benefits per Form 5500	<u><u>\$ 93,887,828</u></u>	<u><u>97,749,203</u></u>

The following is a reconciliation of total additions per the financial statements to the total income per the Form 5500 for the years ended December 31, 2022 and 2021:

	<u>2022</u>	<u>2021</u>
Total net additions per the financial statements	\$ (261,182)	27,395,897
Accrual basis to Cash Basis adjustments:		
Add, prior year employer contribution receivable	4,568,458	4,194,230
Less, current year employer contribution receivable	<u>(5,366,023)</u>	<u>(4,568,458)</u>
Total income per Form 5500	<u><u>\$ (1,058,747)</u></u>	<u><u>27,021,669</u></u>

ARROWSTREET CAPITAL, LIMITED PARTNERSHIP
401(k) PLAN

Schedule H, Line 4i – Schedule of Assets (Held at End of Year)

December 31, 2022

(a)	(b) Identity of issue, borrower, lessor, or similar party	(c) Number of shares	(d) Cost	Current value
	Investments:			
*	Arrowstreet International Equity EAFE Alpha Extension CIT Class D	71,996 shares	**	\$ 10,414,951
*	Arrowstreet Global Equity ACWI CIT Class D	31,631 shares	**	7,335,071
*	Arrowstreet International Equity ACWI ex US CIT Class D	24,717 shares	**	3,350,567
	Credit Suisse Commodity Return Strategy Fund Class A	23,061 shares	**	557,843
*	Fidelity Investment Grade Bond Fund	125,137 shares	**	883,467
*	Fidelity Real Estate Investment Portfolio	35,231 shares	**	1,315,189
*	Fidelity Low-Priced Stock Fund	31,130 shares	**	1,437,888
*	Fidelity Emerging Markets Fund	46,513 shares	**	1,461,437
*	Fidelity New Markets Income Fund	28,190 shares	**	324,467
*	Fidelity Growth Discovery Fund	116,286 shares	**	4,746,786
*	Fidelity High Income Fund	89,662 shares	**	652,737
*	Fidelity® Government Money Market Fund	3,029,154 shares	**	3,029,154
*	Fidelity <i>Nasdaq Composite</i> ® Index Fund	30,388 shares	**	4,007,914
*	Fidelity Strategic Real Return Fund	63,721 shares	**	535,259
*	Fidelity® U.S. Bond Index Fund	91,165 shares	**	928,064
*	Fidelity® Emerging Markets Index Fund	45,774 shares	**	431,652
*	Fidelity® Total Market Index Fund	123,460 shares	**	13,084,333
*	Fidelity® International Index Fund	32,756 shares	**	1,349,202
*	Fidelity® Extended Market Index Fund	57,916 shares	**	3,649,897
*	Fidelity® Inflation-Protected Bond Index Fund	82,777 shares	**	746,647
*	Fidelity Freedom® Index Income Fund - Investor Class	613 shares	**	6,704
*	Fidelity Freedom® Index 2005 Fund - Investor Class	5,010 shares	**	59,821
*	Fidelity Freedom® Index 2010 Fund - Investor Class	160 shares	**	1,912
*	Fidelity Freedom® Index 2015 Fund - Investor Class	3,507 shares	**	45,415
*	Fidelity Freedom® Index 2020 Fund - Investor Class	32,730 shares	**	461,486
*	Fidelity Freedom® Index 2025 Fund - Investor Class	108,798 shares	**	1,730,969
*	Fidelity Freedom® Index 2030 Fund - Investor Class	230,534 shares	**	3,872,970
*	Fidelity Freedom® Index 2035 Fund - Investor Class	188,677 shares	**	3,532,026
*	Fidelity Freedom® Index 2040 Fund - Investor Class	248,266 shares	**	4,707,131
*	Fidelity Freedom® Index 2045 Fund - Investor Class	359,832 shares	**	7,085,098
*	Fidelity Freedom® Index 2050 Fund - Investor Class	207,524 shares	**	4,092,372
*	Fidelity Freedom® Index 2055 Fund - Investor Class	146,960 shares	**	2,385,164
*	Fidelity Freedom® Index 2060 Fund - Investor Class	93,997 shares	**	1,291,524
*	Fidelity® Large Cap Value Index Fund	125,671 shares	**	1,859,930
*	Fidelity® Intermediate Treasury Bond Index Fund	23,307 shares	**	223,280
*	Fidelity® Long-Term Treasury Bond Index Fund	46,948 shares	**	476,052
*	Fidelity® Short-Term Treasury Bond Index Fund	111,605 shares	**	1,099,310
*	Fidelity Freedom® Index 2065 Fund - Investor Class	29,695 shares		329,916
*	Loans to Participants ***			384,223
	Total investments			\$ 93,887,828
*	Denotes party-in-interest			
**	Cost omitted for participant directed investments			
***	Varying maturity dates with interest rates ranging from 4.25% to 7.25%			

See accompanying independent auditors' report.

ARROWSTREET CAPITAL, LIMITED PARTNERSHIP
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Schedule H, Line 4i – Schedule of Assets (Held at End of Year)

December 31, 2022

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