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PIONEER MUNICIPAL HIGH INCOME TRUST
Form N-Q
March 31, 2015

OMB APPROVAL
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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM N-Q

QUARTERLY SCHEDULE OF PORTFOLIO HOLDINGS
OF REGISTERED MANAGEMENT INVESTMENT COMPANY

Investment Company Act file number 811-21321

Pioneer Municipal High Income Trust
(Exact name of registrant as specified in charter)

60 State Street, Boston, MA 02109
(Address of principal executive offices) (ZIP code)

Terrence J. Cullen, Pioneer Investment Management, Inc.,
60 State Street, Boston, MA 02109
(Name and address of agent for service)

Registrant's telephone number, including area code: (617) 742-7825

Date of fiscal year end: April 30

Date of reporting period: January 31, 2015

Form N-Q is to be used by management investment companies, other than small business investment companies registered on Form N-5 (239.24 and 274.5 of this chapter), to file reports with the Commission, not later than 60 days after close of the first and third fiscal quarters, pursuant to Rule 30b1-5 under the Investment Company Act of 1940 (17 CFR 270.30b1-5). The Commission may use the information provided on Form N-Q in its regulatory, disclosure review, inspection, and policymaking roles.

A registrant is required to disclose the information specified by Form N-Q, and the Commission will make this information public. A registrant is not required to respond to the collection of information contained in Form N-Q unless the Form displays a currently valid Office of Management and Budget ("OMB") control number. Please direct comments concerning the accuracy of the information collection burden estimate and any suggestions for reducing the burden to Secretary, Securities and Exchange Commission, 450 Fifth Street, NW, Washington, DC 20549-0609. The OMB has reviewed this collection of information under the clearance requirements of 44 U.S.C. ss. 3507.

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ITEM 1. Schedule of Investments.

File the schedules as of the close of the reporting period as set forth in ss. 210.12-12 12-14 of Regulation S-X [17 CFR 210.12-12 12-14]. The schedules need not be audited.

Pioneer Municipal
High Income Trust

NQ | January 31, 2015

Ticker Symbol: MHI

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Schedule of Investments | 1/31/15 (unaudited)

| Principal Amount USD (\$) | Value |
|--|--|
| TAX EXEMPT OBLIGATIONS - 129.0% of Net Assets (f) | |
| Alabama - 1.5% | |
| 4,500,000 | Huntsville-Redstone Village Special Care Facilities Financing Authority Nursing Home Revenue, 5.5%, 1/1/43 |
| | \$ 4,531,500 |
| Arizona - 0.0%† | |
| 24,000 | Pima County Industrial Development Authority Education Revenue, 6.75%, 7/1/31 |
| | \$ 24,140 |
| California - 11.4% | |
| 3,000,000(a) | Abag Finance Authority for Nonprofit Corp., Revenue, 5.75%, 7/1/37 |
| | \$ 3,130,770 |
| 1,450,000 | California Enterprise Development Authority Recovery Zone Facility Revenue, 8.5%, 4/1/31 |
| | 1,697,443 |
| 1,000,000 | California Municipal Finance Authority, 5.75%, 7/1/30 |
| | 1,063,160 |
| 5,000,000 | California Pollution Control Financing Authority, 5.0%, 7/1/37 (144A) |
| | 5,192,450 |
| 1,740,000 | California School Finance Authority, 7.375%, 10/1/43 |
| | 2,050,781 |
| 1,400,000 | California Statewide Communities Development Authority, 5.625%, 11/1/33 |
| | 1,519,126 |
| 568,006(b)(c) | California Statewide Communities Development Authority Environmental Facilities Revenue, 9.0%, 12/1/38 |
| | 6 |
| 20,000,000(d) | Inland Empire Tobacco Securitization Authority Revenue, 6/1/36 |
| | 3,878,000 |
| 7,885,000(e) | Lehman Municipal Trust Receipts Revenue, RIB, 11.147%, 9/20/28 (144A) |
| | 10,568,975 |
| 2,000,000(g) | Los Angeles Community College District, General Obligation, 4.0%, 8/1/39 |
| | 2,169,460 |
| 2,000,000 | Tobacco Securitization Authority of Northern California Revenue, 5.375%, 6/1/38 |
| | 1,749,860 |
| 3,000,000 | Tobacco Securitization Authority of Southern California Revenue, 5.0%, 6/1/37 |
| | 2,574,030 |
| | \$ 35,594,061 |
| Colorado - 1.5% | |
| 1,500,000 | Colorado Educational & Cultural Facilities Authority, 8.0%, 9/1/43 |
| | \$ 1,550,535 |

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| | | |
|---------------|---|---------------|
| 2,000,000 | Colorado Health Facilities Authority Revenue, 5.25%, 5/15/42 | 2,156,520 |
| 1,000,000 | Kremmling Memorial Hospital District Certificate of Participation, 7.125%, 12/1/45 | 836,480 |
| | | \$ 4,543,535 |
| | Connecticut - 7.6% | |
| 1,000,000 | Hamden Connecticut Facility Revenue, 7.75%, 1/1/43 | \$ 1,036,970 |
| 10,335,000(e) | Lehman Municipal Trust Receipts Revenue, RIB, 11.889%, 8/21/35 | 12,187,549 |
| 5,000,000 | Mohegan Tribe of Indians Gaming Authority, 6.25%, 1/1/31 | 5,000,650 |
| 5,000,000(g) | State of Connecticut, General Obligation, 4.0%, 9/1/30 | 5,554,600 |
| | | \$ 23,779,769 |
| | District of Columbia - 4.0% | |
| 5,000,000 | District of Columbia Tobacco Settlement Financing Corp., 6.5%, 5/15/33 | \$ 6,427,550 |
| 6,000,000 | District of Columbia Tobacco Settlement Financing Corp., 6.75%, 5/15/40 | 6,001,200 |
| | | \$ 12,428,750 |
| | Florida - 6.4% | |
| 1,500,000 | Alachua County Health Facilities Authority Revenue, 8.125%, 11/15/41 | \$ 1,762,710 |
| 1,500,000 | Alachua County Health Facilities Authority Revenue, 8.125%, 11/15/46 | 1,758,750 |
| 500,000 | Capital Trust Agency Revenue Bonds, 7.75%, 1/1/41 | 489,680 |
| 5,000,000 | Florida's Turnpike Enterprise, 4.0%, 7/1/34 | 5,407,550 |
| 1,000,000(a) | Hillsborough County Industrial Development Authority Revenue, 8.0%, 8/15/32 | 1,315,820 |
| 2,260,000(b) | Liberty County Subordinate Revenue, 8.25%, 7/1/28 | 504,613 |
| 2,500,000 | Miami-Dade County Florida Aviation Revenue, 5.5%, 10/1/41 | 2,900,875 |
| 2,250,000(e) | St. Johns County Industrial Development Authority Revenue, 1.344%, 1/1/49 | 835,493 |
| 832,581(b) | St. Johns County Industrial Development Authority Revenue, 2.5%, 1/1/49 | 8 |
| 5,000,000 | Tallahassee Health Facilities Revenue, 6.375%, 12/1/30 | 5,019,800 |
| | | \$ 19,995,299 |
| | Georgia - 5.0% | |
| 4,240,000(e) | Atlanta Georgia Water and Wastewater Revenue, RIB, 10.869%, 11/1/43 (144A) | \$ 4,279,729 |
| 2,500,000 | Clayton County Development Authority Revenue, 8.75%, 6/1/29 | 3,143,325 |
| 3,445,000 | Clayton County Development Authority Revenue, 9.0%, 6/1/35 | 3,520,032 |
| 4,000,000 | Private Colleges & Universities Authority Revenue, 5.0%, 10/1/43 | 4,703,360 |

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| | |
|--|---------------|
| | \$ 15,646,446 |
| Idaho - 1.6% | |
| 5,000,000 Power County Industrial Development Corp., Revenue, 6.45%, 8/1/32 | \$ 5,010,750 |
| Illinois - 14.2% | |

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Schedule of Investments | 1/31/15 (unaudited)

1,827,000(d) Illinois Finance Authority Revenue, 11/15/52 \$ 162,068

Principal
Amount
USD (\$)

Value

| Illinois - (continued) | |
|---|---------------|
| 2,087,000(e) Illinois Finance Authority Revenue, 4.0%, 11/15/52 | \$ 1,335,075 |
| 3,865,000 Illinois Finance Authority Revenue, 6.0%, 8/15/38 | 4,430,991 |
| 2,000,000 Illinois Finance Authority Revenue, 6.0%, 8/15/39 | 2,370,480 |
| 580,000 Illinois Finance Authority Revenue, 6.375%, 5/15/17 | 581,386 |
| 2,500,000 Illinois Finance Authority Revenue, 6.5%, 4/1/39 | 2,789,550 |
| 240,000 Illinois Finance Authority Revenue, 7.0%, 11/15/17 | 240,122 |
| 235,000 Illinois Finance Authority Revenue, 7.0%, 5/15/18 | 235,559 |
| 1,700,000 Illinois Finance Authority Revenue, 7.625%, 5/15/25 | 1,908,420 |
| 600,000 Illinois Finance Authority Revenue, 7.75%, 5/15/30 | 666,114 |
| 2,000,000 Illinois Finance Authority Revenue, 8.0%, 5/15/40 | 2,214,060 |
| 3,200,000 Illinois Finance Authority Revenue, 8.0%, 5/15/46 | 3,527,136 |
| 2,000,000 Illinois Finance Authority Revenue, 8.125%, 2/15/40 | 2,150,140 |
| 2,500,000 Illinois Finance Authority Revenue, 8.25%, 2/15/46 | 2,694,300 |
| 16,880,000(e) Metropolitan Pier & Exposition Authority Dedicated State Tax Revenue, 0.00%, 6/15/22 | 17,902,253 |
| 1,250,000 Southwestern Illinois Development Authority Revenue, 5.625%, 11/1/26 | 1,082,337 |
| | \$ 44,289,991 |
| Indiana - 1.7% | |
| 250,000 City of Carmel Indiana Nursing Home Revenue, 7.0%, 11/15/32 | \$ 282,602 |
| 750,000 City of Carmel Indiana Nursing Home Revenue, 7.125%, 11/15/42 | 844,005 |
| 500,000 City of Carmel Indiana Nursing Home Revenue, 7.125%, 11/15/47 | 560,965 |
| 3,570,000 Vigo County Hospital Authority Revenue, 5.8%, 9/1/47 (144A) | 3,752,606 |
| | \$ 5,440,178 |
| Kentucky - 1.9% | |

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| | | |
|-----------------|---|---------------|
| 5,000,000 | Kentucky Economic Development Finance Authority Revenue, 6.375%, 6/1/40 | \$ 5,874,650 |
| | Louisiana - 3.1% | |
| 2,260,000 | Jefferson Parish Hospital Service District No. 2, 6.375%, 7/1/41 | \$ 2,673,354 |
| 1,500,000 | Louisiana Local Government Environmental Facilities & Community Development Authority Revenue, 6.75%, 11/1/32 | 1,724,280 |
| 5,000,000 | Louisiana Public Facilities Authority Revenue, 5.5%, 5/15/47 | 5,290,900 |
| | | \$ 9,688,534 |
| | Maine - 2.2% | |
| 1,500,000 | Maine Health & Higher Educational Facilities Authority Revenue, 7.5%, 7/1/32 | \$ 1,839,330 |
| 4,480,000 | Maine Turnpike Authority Revenue, 5.0%, 7/1/42 | 5,178,298 |
| | | \$ 7,017,628 |
| | Maryland - 0.5% | |
| 1,500,000 | Maryland Health & Higher Educational Facilities Authority Revenue, 6.75%, 7/1/44 | \$ 1,656,285 |
| | Massachusetts - 4.9% | |
| 7,100,000 | Massachusetts Development Finance Agency Revenue, 5.75%, 1/1/42 | \$ 9,535,655 |
| 595,000 | Massachusetts Educational Financing Authority Revenue, 6.0%, 1/1/28 | 635,531 |
| 4,500,000(b)(c) | Massachusetts Health & Educational Facilities Authority Revenue, 6.5%, 1/15/38 | 11,610 |
| 5,000,000 | Massachusetts Health & Educational Facilities Authority Revenue, 6.75%, 10/1/33 | 5,019,850 |
| | | \$ 15,202,646 |
| | Michigan - 3.4% | |
| 895,000 | Doctor Charles Drew Academy Certificate of Participation, 5.7%, 11/1/36 | \$ 179,036 |
| 2,000,000 | Kent Hospital Finance Authority Revenue, 6.25%, 7/1/40 | 2,023,520 |
| 2,640,000 | Michigan State University Revenue, 5.0%, 8/15/41 | 3,093,816 |
| 6,100,000 | Michigan Tobacco Settlement Finance Authority Revenue, 6.0%, 6/1/48 | 5,277,537 |
| | | \$ 10,573,909 |
| | Minnesota - 0.8% | |
| 2,000,000 | Port Authority of the City of Bloomington, Minnesota Recovery Zone Facility Revenue, 9.0%, 12/1/35 | \$ 2,349,960 |
| | Montana - 0.0%† | |
| 1,600,000(b)(c) | Two Rivers Authority, Inc., Project Revenue, 7.375%, 11/1/27 | \$ 126,112 |

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New Jersey - 1.9%

| | | |
|-----------|---|--------------|
| 3,000,000 | New Jersey Economic Development Authority Revenue, 5.25%, 9/15/29 | \$ 3,250,320 |
| 2,500,000 | New Jersey Economic Development Authority Revenue, 5.75%, 9/15/27 | 2,786,700 |
| | | \$ 6,037,020 |

New Mexico - 1.3%

| | | |
|-----------|---|--------------|
| 1,500,000 | Otero County New Mexico Project Revenue, 6.0%, 4/1/23 | \$ 1,385,310 |
| 2,960,000 | Otero County New Mexico Project Revenue, 6.0%, 4/1/28 | 2,576,917 |
| | | \$ 3,962,227 |

Principal
Amount
USD (\$)

Value

New York - 9.6%

| | | |
|--------------|--|---------------|
| 2,000,000 | Chautauqua County Capital Resource Corp., Revenue, 8.0%, 11/15/30 | \$ 2,107,340 |
| 2,000,000 | Hempstead Local Development Corp., Revenue, 5.75%, 7/1/39 | 2,271,260 |
| 2,000,000 | New York City Industrial Development Agency Revenue, 5.25%, 12/1/32 | 2,004,620 |
| 2,000,000 | New York City Industrial Development Agency Revenue, 7.625%, 12/1/32 | 2,011,480 |
| 7,040,000(e) | New York State Dormitory Authority Revenue, RIB, 15.901%, 5/29/14 (144A) | 8,624,211 |
| 7,500,000 | New York State Dormitory Authority Revenue, 5.0%, 3/15/39 | 8,840,175 |
| 1,000,000 | New York State Dormitory Authority Revenue, 6.125%, 12/1/29 | 1,115,080 |
| 2,577,540 | Westchester County Healthcare Corp., Revenue, 5.0%, 11/1/44 | 2,963,424 |
| | | \$ 29,937,590 |

North Dakota - 0.9%

| | | |
|-----------|-------------------------------------|--------------|
| 2,525,000 | County of Burleigh ND, 5.0%, 7/1/38 | \$ 2,777,475 |
|-----------|-------------------------------------|--------------|

Ohio - 3.3%

| | | |
|--------------|--|---------------|
| 2,500,000 | Buckeye Tobacco Settlement Financing Authority Revenue, 5.875%, 6/1/47 | \$ 2,124,625 |
| 1,700,000 | Buckeye Tobacco Settlement Financing Authority Revenue, 6.0%, 6/1/42 | 1,448,536 |
| 5,000,000 | Buckeye Tobacco Settlement Financing Authority Revenue, 6.5%, 6/1/47 | 4,603,450 |
| 2,000,000(e) | Ohio Air Quality Development Authority Revenue, 3.1%, 3/1/23 | 2,066,780 |
| | | \$ 10,243,391 |

Oregon - 1.9%

| | | |
|-----------|--|--------------|
| 5,190,000 | Oregon Health & Science University Revenue, 5.0%, 7/1/32 | \$ 6,067,421 |
|-----------|--|--------------|

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| | | |
|---------------------|--|---------------|
| Pennsylvania - 5.9% | | |
| 1,550,000 | Allegheny County Hospital Development Authority Revenue, 5.125%, 5/1/25 | \$ 1,561,206 |
| 1,280,000(b)(c) | Langhorne Manor Borough Higher Education Authority Revenue, 7.35%, 7/1/22 | 371,213 |
| 5,000,000 | Pennsylvania Economic Development Financing Authority Solid Waste Disposal Revenue, 6.0%, 6/1/31 | 5,000,800 |
| 1,000,000 | Philadelphia Authority for Industrial Development Revenue, 6.5%, 6/15/33 (144A) | 1,031,380 |
| 2,000,000 | Philadelphia Authority for Industrial Development Revenue, 6.75%, 6/15/43 (144A) | 2,068,800 |
| 2,000,000 | Philadelphia Authority for Industrial Development Revenue, 8.2%, 12/1/43 | 2,255,460 |
| 5,900,000 | Philadelphia Hospitals & Higher Education Facilities Authority Revenue, 5.0%, 7/1/34 | 5,976,169 |
| | | \$ 18,265,028 |
| Puerto Rico - 0.9% | | |
| 3,255,000(g) | Commonwealth of Puerto Rico, General Obligation, 8.0%, 7/1/35 | \$ 2,721,896 |
| Rhode Island - 1.3% | | |
| 5,900,000(b)(c) | Central Falls Rhode Island Detention Facility Corp., Revenue, 7.25%, 7/15/35 | \$ 2,387,848 |
| 1,500,000 | Rhode Island Health & Educational Building Corp., Revenue, 8.375%, 1/1/46 | 1,748,190 |
| | | \$ 4,136,038 |
| Tennessee - 1.6% | | |
| 4,600,000 | Sullivan County Health, Educational & Housing Facilities Board Revenue, 5.25%, 9/1/36 | \$ 4,841,040 |
| Texas - 16.3% | | |
| 1,000,000 | Arlington Higher Education Finance Corp., Revenue Bonds, 7.0%, 3/1/34 | \$ 1,072,810 |
| 2,500,000 | Central Texas Regional Mobility Authority Revenue, 6.75%, 1/1/41 | 3,092,050 |
| 5,000,000(g) | Goose Creek Consolidated Independent School District, General Obligation, 4.0%, 2/15/26 | 5,749,750 |
| 725,078(b)(c) | Gulf Coast Industrial Development Authority Revenue, 7.0%, 12/1/36 | 7 |
| 3,750,000 | Houston Airport System Special Facilities Revenue, 5.7%, 7/15/29 | 3,760,050 |
| 5,340,000 | Lubbock Health Facilities Development Corp., Nursing Home Revenue, 6.625%, 7/1/36 | 5,524,977 |
| 10,000,000 | North Texas Tollway Authority Transportation Revenue, 5.75%, 1/1/33 | 11,166,800 |
| 1,500,000 | Red River Health Facilities Development Corp., Revenue, 8.0%, 11/15/41 | 1,792,515 |
| 4,000,000 | Sanger Industrial Development Corp., Revenue, 8.0%, 7/1/38 | 4,497,560 |
| 7,040,000(e)(g) | | 7,226,490 |

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| | | |
|-----------|--|---------------|
| | State of Texas, General Obligation, RIB, 12.548%, 4/1/30 | |
| 2,000,000 | Tarrant County Cultural Education Facilities Finance Corp., Revenue, 8.0%, 11/15/34 | 2,358,780 |
| 1,000,000 | Tarrant County Cultural Education Facilities Finance Corp., Revenue, 8.125%, 11/15/39 | 973,340 |
| 1,000,000 | Tarrant County Cultural Education Facilities Finance Corp., Revenue, 8.25%, 11/15/44 | 980,270 |
| 2,500,000 | Travis County Health Facilities Development Corp., Revenue, 7.125%, 1/1/46 | 2,745,700 |
| | | \$ 50,941,099 |

Principal
Amount
USD (\$)

| | | Value |
|------------------|--|----------------|
| | Virginia - 1.4% | |
| 4,000,000 | Upper Occoquan Sewage Authority Revenue, 4.0%, 7/1/41 | \$ 4,389,400 |
| | Washington - 7.5% | |
| 14,315,000(d)(g) | State of Washington, General Obligation, 6/1/22 | \$ 12,530,492 |
| 3,795,000 | Washington State Health Care Facilities Authority Revenue, 6.0%, 1/1/33 | 4,407,779 |
| 1,150,000 | Washington State Housing Finance Commission Revenue, 6.75%, 10/1/47 | 1,266,840 |
| 5,000,000 | Washington State Housing Finance Committee Nonprofit Revenue, 5.625%, 1/1/27 | 5,051,750 |
| | | \$ 23,256,861 |
| | West Virginia - 0.9% | |
| 2,000,000 | City of Philippi WV, 7.75%, 10/1/44 | \$ 2,074,380 |
| 735,000 | West Virginia Hospital Finance Authority Hospital Revenue, 9.125%, 10/1/41 | 866,440 |
| | | \$ 2,940,820 |
| | Wisconsin - 2.6% | |
| 5,000,000 | Wisconsin Public Finance Authority Continuing Care Retirement Community Revenue, 8.25%, 6/1/46 | \$ 5,951,500 |
| 400,000 | Wisconsin State Public Finance Authority Revenue, 8.375%, 6/1/20 | 401,392 |
| 1,500,000 | Wisconsin State Public Finance Authority Revenue, 8.625%, 6/1/47 | 1,830,345 |
| | | \$ 8,183,237 |
| | TOTAL TAX EXEMPT OBLIGATIONS (Cost \$367,928,630) | \$ 402,474,686 |
| | MUNICIPAL COLLATERALIZED DEBT OBLIGATION - 0.4% of Net Assets | |
| 10,000,000(c)(e) | Non-Profit Preferred Funding Trust I, 0.0%, 9/15/37 (144A) | \$ 1,348,400 |

| | |
|--|------------------|
| TOTAL MUNICIPAL COLLATERALIZED DEBT OBLIGATION (Cost \$10,000,000) | \$ 1,348,400 |
| TOTAL INVESTMENTS IN SECURITIES - 129.4% (Cost - \$377,928,630) (h)(i) | \$ 403,823,086 |
| OTHER ASSETS AND LIABILITIES -3.0% | \$ 9,265,501 |
| PREFERRED SHARES AT REDEMPTION VALUE, INCLUDING DIVIDENDS PAYABLE - (32.4)% | \$ (101,001,211) |
| NET ASSETS APPLICABLE TO COMMON SHAREOWNERS - 100.0% | \$ 312,087,376 |

† Amount rounds to less than 0.1%.

(144A) Security is exempt from registration under Rule 144A of the Securities Act of 1933. Such securities may be resold normally to qualified institutional buyers in a transaction exempt from registration. At January 31, 2015, the value of these securities amounted to \$36,866,551, or 11.8% of total net assets applicable to common shareowners.

RIB Residual Interest Bond. The interest rate is subject to change periodically and inversely based upon prevailing market rates. The interest rate shown is the rate at January 31, 2015.

- (a) Prerefunded bonds have been collateralized by U.S. Treasury or U.S. Government Agency securities which are held in escrow to pay interest and principal on the tax exempt issue and to retire the bonds in full at the earliest refunding date.
- (b) Security is in default and is non income producing.
- (c) Indicates a security that has been deemed illiquid. As of January 31, 2015 the aggregate cost of illiquid securities in the Trust's portfolio was \$20,741,155. As of that date, the aggregate value of illiquid securities in the Trust's portfolio of \$4,245,196 represented 1.4% of total net assets applicable to common shareowners.
- (d) Security issued with a zero coupon. Income is recognized through accretion of discount.
- (e) The interest rate is subject to change periodically. The interest rate shown is the rate at January 31, 2015.
- (f) Consists of Revenue Bonds unless otherwise indicated.
- (g) Represents a General Obligation Bond.

(h) The concentration of investments by type of obligation/ market sector is as follows :

| | |
|---------------------------|--------|
| Insured | 15.1% |
| Revenue Bonds: | |
| Health Revenue | 16.9 |
| Development Revenue | 15.4 |
| Other Revenue | 13.6 |
| Facilities Revenue | 10.9 |
| Education Revenue | 8.7 |
| Tobacco Revenue | 8.4 |
| Transportation Revenue | 5.4 |
| Water Revenue | 2.4 |
| Airport Revenue | 2.0 |
| Pollution Control Revenue | 1.2 |
| | 100.0% |

(i) At January 31, 2015, the net unrealized appreciation on investments based on cost for federal tax purposes of \$373,646,890 was as follows:

| | |
|--|---------------|
| Aggregate gross unrealized appreciation for all investments in which there is an excess of value over tax cost | \$ 48,220,601 |
| Aggregate gross unrealized depreciation for all investments in which there is an excess of tax cost over value | (18,044,405) |
| Net unrealized appreciation | \$ 30,176,196 |

For financial reporting purposes net unrealized appreciation on investments was \$25,894,456 and cost of investments aggregated \$377,928,630.

Various inputs are used in determining the value of the Trust's investments. These inputs are summarized in the three broad levels below.

Level 1 - quoted prices in active markets for identical securities.

Level 2 - other significant observable inputs (including quoted prices for similar securities, interest rates, prepayment speeds, credit risks, etc.).

Level 3 - significant unobservable inputs (including the Trust's own assumptions in determining fair value of investments).

Generally, equity securities are categorized as Level 1, fixed income securities and senior loans are categorized as Level 2, and securities valued using fair value methods (other than prices supplied by independent pricing services or broker dealers) as Level 3.

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The following is a summary of the inputs used as of January 31, 2015, in valuing the Trust's investments.

| | Level 1 | Level 2 | Level 3 | Total |
|--|---------|----------------|---------|----------------|
| Tax Exempt Obligations | \$- | \$402,474,686 | \$- | \$ 402,474,686 |
| Municipal Collateralized Debt Obligation | - | 1,348,400 | - | 1,348,400 |
| Total Investments in Securities | \$- | \$ 403,823,086 | \$- | \$ 403,823,086 |

The following is a reconciliation of assets valued using significant unobservable inputs (Level 3):

| | Balance as of 4/30/14 | Realized gain (loss) | Change in unrealized appreciation (depreciation) | Purchases | Sales | Accrued discounts/premiums | Transfers in to Level 3* | Transfers out of Level 3* | Balance as of 1/31/15 |
|------------------------|-----------------------|----------------------|--|-----------|---------------|----------------------------|--------------------------|---------------------------|-----------------------|
| Tax Exempt Obligations | \$2,955,000 | \$339,303 | \$(156,198) | \$- | \$(3,139,500) | \$1,395 | \$- | \$- | \$- |
| Total | \$2,955,000 | \$339,303 | \$(156,198) | \$- | \$(3,139,500) | \$1,395 | \$- | \$- | \$- |

* Transfers are calculated on the beginning of period values. During the nine months ended January 31, 2015, there were not transfers between Levels 1, 2 and 3.

Net change in unrealized appreciation (depreciation) of Level 3 investments still held and considered Level 3 at January 31, 2015: \$0.

ITEM 2. CONTROLS AND PROCEDURES.

(a) Disclose the conclusions of the registrant's principal executive and principal financial officers, or persons performing similar functions, regarding the effectiveness of the registrant's disclosure controls and procedures (as defined in Rule 30a-3(c) under the Act (17 CFR 270.30a-3(c))) as of a date within 90 days of the filing date of the report that includes the disclosure required by this paragraph, based on the evaluation of these controls and procedures required by Rule 30a-3(b) under the Act (17 CFR 270.30a-3(b)) and Rule 13a-15(b) or 15d-15(b) under the Exchange Act (17 CFR 240.13a-15(b) or 240.15d-15(b)).

The registrant's principal executive officer and principal financial officer have concluded that the registrant's disclosure controls and procedures are effective based on their evaluation of these controls and procedures as of a date within 90 days of the filing date of this report.

(b) Disclose any change in the registrant's internal controls over financial reporting (as defined in Rule 30a-3(d) under the Act (17 CFR 270.30a-3(d))) that occurred during the registrant's last fiscal quarter that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting.

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There were no significant changes in the registrant's internal control over financial reporting that occurred during the second fiscal quarter of the period covered by this report that have materially affected, or are reasonably likely to materially affect, the registrant's internal control over financial reporting.

ITEM 3. EXHIBITS.

File as exhibits as part of this Form a separate certification for each principal executive officer and principal financial officer of the registrant as required by Rule 30a-2(a) under the Act (17 CFR 270.30a-2(a)), exactly as set forth below:

CERTIFICATIONS

I, [identify the certifying individual], certify that:

1. I have reviewed this report on Form N-Q of [identify registrant];
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the schedules of investments included in this report fairly present in all material respects the investments of the registrant as of the end of the fiscal quarter for which the report is filed;
4. The registrants other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Rule 30a-3(c) under the Investment Company Act of 1940) and internal control over financial reporting (as defined in Rule 30a-3(d) under the Investment Company Act of 1940) for the registrant and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - (c) Evaluated the effectiveness of the registrants disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of a date within 90 days prior to the filing date of this report, based on such evaluation; and
 - (d) Disclosed in this report any change in the registrants internal control over financial reporting that occurred during the registrants most recent fiscal quarter that has materially affected, or is reasonably likely to materially affect, the registrants internal control over financial reporting; and
5. The registrants other certifying officer(s) and I have disclosed to the registrants auditors and the audit committee of the registrants board of directors (or persons performing the equivalent functions):

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(a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrants ability to record, process, summarize, and report financial information; and

(b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrants internal control over financial reporting.

Date:

[Signature] [Title]

Filed herewith.

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SIGNATURES

[See General Instruction F]

Pursuant to the requirements of the Securities Exchange Act of 1934 and the Investment Company Act of 1940, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

(Registrant) Pioneer Municipal High Income Trust

By (Signature and Title)* /s/ Lisa M.Jones

Lisa M.Jones, President and Chief Executive Officer

Date March 31, 2015

Pursuant to the requirements of the Securities Exchange Act of 1934 and the Investment Company Act of 1940, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

By (Signature and Title)* /s/ Lisa M.Jones

Lisa M.Jones, President and Chief Executive Officer

Date March 31, 2015

By (Signature and Title)* /s/ Mark E. Bradley

Mark E. Bradley, Treasurer and Chief Accounting
and Financial Officer

Date March 31, 2015

* Print the name and title of each signing officer under his or her signature.